



CHESAPEAKE BAY FOUNDATION  
*Saving a National Treasure*

**OFFICERS**

D. KEITH CAMPBELL  
CHAIRMAN

JAMES E. ROGERS  
VICE CHAIRMAN

SUSAN S. PHILLIPS  
SECRETARY

ALAN L. WURTZEL  
TREASURER

WILLIAM C. BAKER  
PRESIDENT

**EX OFFICIO TRUSTEES**

GOVERNOR MARTIN O'MALLEY

GOVERNOR EDWARD G. RENDELL

GOVERNOR ROBERT F. McDONNELL

MAYOR ADRIAN M. FENTY

JOANNE S. BERKLEY  
BAY CARE CHAPTER

HAL C. B. CLAGETT  
CLAGETT TRUSTEE

**TRUSTEES**

JANE P. BATTEN

DONALD F. BOESCH, PH.D.

W. RUSSELL G. BYERS, JR.

JOHN T. CASTEEN, III

AMANDA DEEVER

RICHARD L. FRANYO

G. WADDY GARRETT

ALAN R. GRIFFITH

CAROLYN GROOBEE

ANN FRITZ HACKETT

MICHAEL J. HANLEY

ROBERT A. KINSLEY

MATTHEW J. KLEIN

BYRON F. MARCHANT

H. TURNEY MCKNIGHT

CHARLES W. MOORMAN, IV

W. TAYLOE MURPHY, JR.

MARIE W. RIDDER

ALEXIS G. SANT

TRUMAN T. SEMANS

SIMON SIDAMON-ERISTOFF

JENNIFER STANLEY

RT. REV. BISHOP EUGENE TAYLOR SUTTON

ANTHONY A. WILLIAMS

PETER L. WOICKE

**HONORARY TRUSTEES**

LOUISA C. DUEMLING

C. A. PORTER HOPKINS

BURKS B. LAPHAM

T. GAYLON LAYFIELD, III

H. F. LENFEST

M. LEE MARSTON

WAYNE A. MILLS

RUSSELL C. SCOTT

THOMAS H. STONER

AILEEN BOWDOIN TRAIN

November 5, 2010

**VIA E-MAIL**

Commonwealth of Virginia  
[vabaytmdl@dcv.virginia.gov](mailto:vabaytmdl@dcv.virginia.gov)

**Subject:** Comments on *Chesapeake Bay TMDL Phase 1 Watershed Implementation Plan* prepared by the Commonwealth of Virginia

Dear Sir/Madam:

On behalf of the Chesapeake Bay Foundation's (CBF's) 89,000 members in Virginia, please accept this letter as formal comment on the *Chesapeake Bay TMDL Phase 1 Watershed Implementation Plan* (draft WIP) prepared by the Commonwealth of Virginia and submitted to the U.S. Environmental Protection Agency (EPA) on September 3, 2010.<sup>1</sup> We very much appreciate the dedication of the many state agency staff that contributed to the draft WIP. We further thank the Commonwealth for the opportunity to comment upon this critical work.

Unfortunately, CBF finds that the draft WIP falls far short of providing assurance that actions will be taken by 2025 to achieve the reductions in nitrogen (TN), phosphorus (TP), and sediment pollution called for in the Chesapeake Bay Total Maximum Daily Load (Bay TMDL).<sup>2</sup> Promising ideas in the draft WIP are overshadowed by the failure to attain the TMDL allocations in the James River basin and a critical lack of "reasonable assurance," that is, the details, commitments, and accountability needed to cut pollution, particularly nonpoint source (NPS) pollution. Considering the long history of the Bay clean-up effort, the constructive exchange of ideas within the Stakeholder Advisory Group (SAG) over the last year, and the many ambitious new concepts for delivering pollution reductions put forward in earlier versions of the WIP, the draft WIP as submitted to EPA is a significant disappointment.

As has been voiced by EPA and diverse state interests since the release of the draft WIP, CBF concurs that a solution *by Virginia for Virginia* is best. There is no question that this approach allows a deeper chest of tools and more flexibility in how to achieve the Bay TMDL than is afforded outside entities.

<sup>1</sup> *Chesapeake Bay TMDL Phase 1 Watershed Implementation Plan. Revision of the Chesapeake Bay Nutrient and Sediment Tributary Strategy. Public Review Draft. Commonwealth of Virginia. September 2010. Hereinafter "draft WIP."*

<sup>2</sup> *Draft Chesapeake Bay Total Maximum Daily Load. U.S. Environmental Protection Agency. September 24, 2010.*

With that belief in mind, herein, CBF provides specific comments to facilitate improvements to the draft WIP. In **Section I** we describe requirements under the law for Virginia's creation of a WIP that meets TMDL allocations with a high level of reasonable assurance and in **Section II** we demonstrate that the draft WIP does not approach providing reasonable assurance. **Section III** provides a summary of our recommended revisions to the draft WIP, and the attached **Exhibit 1** provides a detailed evaluation of the draft WIP and specific recommendations on how to create a final WIP that meets TMDL goals. Our recommendations are focused on reducing TN and TP pollution, so the terms "nutrient pollution" and "pollution" used hereinafter refer to these pollutants. In **Section IV** we offer a revised set of pollution allocations, which only deviate from the pollution allocations envisioned in the Commonwealth's August 24, 2010 "discussion draft" by requiring additional reductions from the wastewater source sector.<sup>3</sup> **Section V** highlights the economic benefits of clean water, and the attached **Exhibit 2** extensively documents this fact. And lastly, **Section VI** closes the comments by discussing the economic benefits of clean water and the current state of affairs that justify a new approach to cleaning the Bay and its rivers.

We believe a final WIP that incorporates our recommendations can achieve our revised pollution allocations, and will be achievable, accountable, and give Virginia assurance that the Bay TMDL will be met. Submittal of such a final WIP by the Commonwealth will allow the McDonnell Administration to do something seven previous Governors have failed to do: once and for all to meet their obligation under the Virginia Constitution, state as well as federal law, and multiple agreements to protect the Bay and its rivers from pollution. CBF has, and will continue, to hold EPA to this same high standard when evaluating the draft Bay TMDL. We hereby incorporate by reference the written comments of CBF, the Choose Clean Water Coalition, and Rebecca Hanmer on the Bay TMDL submitted to EPA under Docket no. EPA-R03-OW-2010-0736.

In the event that the Administration does not take this last opportunity seriously, and again submits a WIP that fails to provide reasonable assurance, we firmly stand behind EPA's proposal to approve a "backstop" TMDL, use its "residual authority" to establish more stringent requirements for NPS, and take other appropriate actions to ensure the Bay is finally put on a more certain path toward restoration. It is EPA's duty under the Clean Water Act to protect our waters if Virginia fails to do so.

The Commonwealth and the other six Bay jurisdictions have made important progress reducing pollution. However, the evidence is clear that our mostly voluntary efforts to cut the pollution running off the lands that house and feed our growing population have not, and will not, finish the job. Our recommendations are specifically intended to help solve the growing problem of NPS pollution.

---

<sup>3</sup>Commonwealth of Virginia. 2010. *Virginia's Watershed Implementation Plan: Background, Approach and Summary of Proposed Actions Discussion Draft, 8/24/2010*. This document was distributed at the last SAG meeting before release of the draft WIP. It proposed levels of treatment and corresponding actions for the main source sectors. The levels of treatment corresponded to a scoping spreadsheet distributed to the SAG that described for TN and TP current reduction progress, allocations consistent with an "everything, everywhere, by everyone" or E3 level of treatment, and allocations consistent with two lesser treatment levels, termed Level 2 and Level 3.

We now have before us a once-in-a-lifetime opportunity to move beyond 30 years of unmet obligations and vital, yet partial, progress to once and for all protect the Bay and its rivers, and in turn, safeguard the hundreds of thousands of jobs and tens of billions in annual economic activity these waters increasingly struggle to sustain. Our efforts today will prevent another generation of the Bay region's children from inheriting our mess.

***I. The Clean Water Act and Virginia Law Require that Virginia Adopt an Adequate Watershed Implementation Plan that Meets Bay TMDL Allocations and Provides Reasonable Assurances that Necessary Pollution Reductions Will be Achieved.***

Virginia's responsibility to develop an adequate WIP that meets the Bay TMDL allocations and provides reasonable assurances of required pollution reductions is founded, contrary to suggestions in the draft WIP,<sup>4</sup> on the firm requirements of both state and federal law.

**A. Under the Clean Water Act, TMDLs Must Be Established at Levels Meeting Water Quality Standards and Be Adequately Implemented.**

The Clean Water Act (CWA)<sup>5</sup> and implementing regulations provide the basis on which the draft WIP must be evaluated. Enacted in 1972 to compel the restoration of the nation's waters,<sup>6</sup> the CWA requires the states to establish water quality standards for the waters within their boundaries and to take the necessary actions to ensure that the waters meet those standards, thereby achieving CWA's goals. If a state does not promulgate water quality standards or falls short of CWA requirements in doing so, EPA will set the standards for the state.<sup>7</sup> The CWA prescribes the use of technology-based effluent limitations for most point source discharges<sup>8</sup> and, if those measures do not achieve water quality standards, CWA requires the use of water quality-based controls under Section 303(d).<sup>9</sup>

The draft WIP forms part of the CWA's § 303(d) TMDL program, which requires identification and listing of all impaired water bodies within a state's borders. For each impaired water body, Section 303 and implementing regulations require the state to establish a TMDL for specified pollutants.<sup>10</sup> A TMDL is the maximum amount of a pollutant—from background, point and nonpoint sources, together with a margin of safety—that the water body can receive and still attain water quality standards.<sup>11</sup> These requirements apply to both point and nonpoint sources of

---

<sup>4</sup> See, e.g., draft WIP, at i (noting Governor McDonnell's stated concerns about the "legality," "compressed timing," and other aspects of the draft Bay TMDL).

<sup>5</sup> 33 U.S.C. §§ 1251, *et seq.*

<sup>6</sup> 33 U.S.C. §§ 1251(a)(2) and 1313(c)(1) (CWA goal is to "restore and maintain the chemical, physical and biological integrity of the Nation's waters").

<sup>7</sup> 33 U.S.C. §§ 1303(b), (c)(3)-(4).

<sup>8</sup> 33 U.S.C. § 1311(b)(1).

<sup>9</sup> 33 U.S.C. § 1313(d).

<sup>10</sup> 33 U.S.C. § 1313(d)(1)(C). Development of a TMDL is mandatory when triggered by the CWA. See *Natural Resources Defense Council v. Fox*, 909 F. Supp. 153 (S.D.N.Y. 1995) (EPA must establish TMDLs based on Congress's use of the word "shall" in Section 303); *Alaska Center for the Environment v. Reilly*, 762 F. Supp. 1422 (W.D. Wa. 1991) (EPA has a mandatory duty to promulgate TMDLs).

<sup>11</sup> See 33 U.S.C. § 1313(d)(1)(C); 40 CFR §§ 30.2(e)-(i).



pollution.<sup>12</sup> When triggered by CWA requirements, the states and EPA are required to establish a TMDL, as courts have recognized.<sup>13</sup>

Once a TMDL is established and approved by EPA, the state must adequately implement it to ensure water quality goals are attained. Thus, CWA § 303(e)(1) requires each state to have a continuing planning process that results in implementation plans for all navigable waters within state boundaries, which include effluent limitations and compliance schedules as required, §303(d) TMDLs for pollutants, and “adequate implementation, including schedules of compliance, for revised or new water quality standards.”<sup>14</sup> Resorting to a TMDL is the CWA’s “backup” strategy for achieving water quality standards; it is invoked when point source permits and best management practices (BMPs) for NPS have not succeeded.<sup>15</sup> Accordingly, EPA may only approve a state-submitted implementation plan that provides assurances it will succeed in “implement[ing] applicable water quality standards.”<sup>16</sup>

What constitutes reasonable assurances will vary depending on the water body and the pollution sources at issue.<sup>17</sup> In the case of TMDLs for waters impaired only by point sources, National Pollutant Discharge Elimination System (NPDES) permitting may be sufficient to provide reasonable assurance that the TMDL’s waste load allocations (WLAs) will be achieved. For waters impaired by both point and nonpoint sources, a TMDL may not allocate WLAs based on an assumption that NPS load reductions will occur unless the TMDL provides reasonable assurances that NPS control measures will achieve expected load reductions.<sup>18</sup> The bottom line is clear, however: to carry out CWA’s command to ensure water quality standards are attained, EPA must be able to determine that a plan’s claimed load allocations are not based on excessively optimistic hopes concerning the amount of NPS pollutant reductions that will occur. “If the reductions embodied in load allocations are not fully achieved because of a failure to fully implement needed NPS controls, the collective reductions from point and NPS will not result in attainment of the water quality standards.”<sup>19</sup>

#### **B. Under Virginia Law, TMDLs Must Be Established at Levels Meeting Water Quality Standards and Be Adequately Implemented.**

---

<sup>12</sup> E.g., *Pronsolino v. Nastro*, 291 F. 3d 1123, 1135-1140 (9<sup>th</sup> Cir. 2002).

<sup>13</sup> E.g., *Natural Resources Defense Council v. Fox*, 909 F. Supp. 153 (S.D.N.Y.1995) (EPA must establish TMDLs based on Congress’s use of the word “shall” in CWA § 303); *Alaska Center for the Environment v. Reilly*, 762 F. Supp. 1422 (W.D. Wa. 1991) (EPA has a mandatory duty to promulgate TMDLs); *Sierra Club v. Hankinson*, 939 F. Supp. 872, 873 (N.D. Ga. 1996) (To attain CWA goals, EPA must ensure that TMDLs are implemented).

<sup>14</sup> See 33 U.S.C. §§ 1313(e)(1) and (e)(3)(C),(F); 40 C.F.R. Part 130.6(b),(c) (TMDLs must be included in Water Quality Management Plans used to direct implementation).

<sup>15</sup> See 33 U.S.C. § 1313(d)(1)(A); 40 C.F.R. § 130.7(b)(1).

<sup>16</sup> See 33 U.S.C. § 1313(d)(2).

<sup>17</sup> See *Guidelines for Water Quality-Based Decisions: The TMDL Process* (1991 EPA Office of Water Regulations and Standards) (“1991 Guidance”).

<sup>18</sup> *Guidelines for Reviewing TMDLs Under Existing Regulations Issued in 1992* (EPA 2002), available at <http://www.epa.gov/owow/tmdl/guidance/final52002.html> (“2002 Guidance”).

<sup>19</sup> See Correspondence, dated November 9, 2009, from William C. Early, Acting EPA Regional Administrator, to L. Preston Bryant, Virginia Secretary of Natural Resources, at 5.



The requirement that Virginia adopt an adequate plan to implement a TMDL for impaired waters has been part of the law of the Commonwealth for many years. In fact, even before the enactment of the CWA, the Commonwealth was committed to both protecting and *restoring* state waters. The Constitution of Virginia proclaims, “To the end that the people have . . . pure water . . . , it shall be the policy of the Commonwealth . . . to protect its . . . waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth.”<sup>20</sup> In 1950, the General Assembly first enacted Virginia’s State Water Control Law (SWCL),<sup>21</sup> which reaffirms the Commonwealth’s obligation to protect high-quality state waters and to restore “all other state waters to such condition of quality that any such waters will permit all reasonable public uses and will support the propagation and growth of all aquatic life, including game fish, which might reasonably be expected to inhabit them.”<sup>22</sup>

Building on these foundational laws, Virginia adopted the requirements of the CWA §303(d) program, along with other measures to protect water quality.<sup>23</sup> Thus, the General Assembly mandated that the State Water Control Board (Board) prepare CWA § 303(d) reports that identify state waters impaired by nutrients, sediments, and other pollutants and determine the impairments’ causes among point and NPS.<sup>24</sup> The Board is specifically required to “develop and implement a plan to achieve fully supporting status” —defined as “meeting the fishable and swimmable goals of the CWA” —for impaired waters.<sup>25</sup> The implementation plans must state the date of expected completion, measurable goals, necessary corrective actions, the associated costs, benefits, and environmental impacts of addressing impairment, and expeditious development and implementation of total maximum daily loads.<sup>26</sup>

These statutes leave no doubt that the CWA governs Virginia’s implementation plans, including the draft WIP at issue. Indeed, it commands the Board to “develop *and implement* pursuant to a schedule total maximum daily loads of pollutants that may enter the water for each impaired water body *as required by the Clean Water Act*.”<sup>27</sup> Accordingly, the adequacy of the draft WIP at issue here must be measured against the CWA requirements, including the

---

<sup>20</sup> Va. Const., art. XI, sec. 1.

<sup>21</sup> Va. Code §§ 62.1-44.2, *et seq.*

<sup>22</sup> Va. Code § 62.1-44.2.

<sup>23</sup> Other Virginia water quality statutes include Va. Code §§ 62.1-44.19:12 (Chesapeake Bay Watershed Nutrient Credit Exchange Program,) and 2.2-218 (requiring Secretary of Natural Resources to “coordinate the development of tributary plans” that address nutrients and sediments entering Chesapeake Bay).

<sup>24</sup> Va. Code §§ 62.1-44.19:5.C and 62.1-44.19:5.D.

<sup>25</sup> Va. Code § 62.1-44.19:7.A.

<sup>26</sup> *Id.*

<sup>27</sup> Va. Code § 62.1-44-19:8 (emphasis added). The General Assembly also emphasized the importance of the task by mandating that the Secretary of Natural Resources develop plans for cleanup of the impaired waters of the Chesapeake Bay as designated by EPA, and further mandated that the plan be revised as needed to reflect strategies, timetables, and milestones, measurable and attainable objectives, strategies to meet specific and attainable timetables outlined in the plan, time frames or phasing to accomplish plan objectives and the expected date of completion, a clearly defined, prioritized, and funded program of work within the plan for better point and nonpoint source cleanup, disbursement projection plan with list of specific projects, problem areas, risk mitigation strategies, descriptions of extent of coordination, assessments of alternative funding mechanisms, recommendations to funding committees for legislative action. *See* VA Code § 62.1-44.117.

requirements of meeting the Bay TMDL's allocations and providing reasonable assurances of pollutant load reductions.

**C. EPA Is Required by CWA §§ 303(d) and 117(g) to Issue the Bay TMDL and Proceed with the TMDL Process.**

EPA is authorized to issue the Bay TMDL and proceed with the Bay TMDL process as a result of the Bay waters' § 303(d) listing, the failure of Virginia and other Bay states to prepare required TMDLs, and CWA § 117(g).

The long history of and incomplete progress in restoring the Bay are well documented. Over the course of the last 25 and more years, the Bay jurisdictions and the federal government have committed and re-committed themselves to the goal of restoring the waters of the Chesapeake Bay and tidal tributaries. *See, e.g.*, 1983 Chesapeake Bay Agreement (agreement by the governors of Maryland, Virginia, and Pennsylvania, the District of Columbia mayor, the chairman of the Chesapeake Bay Commission, and the EPA Administrator to form the Chesapeake Bay Executive Council to implement plans for protecting Bay water quality); 1987 Chesapeake Bay Agreement (agreement by same parties to a 40 percent reduction in point source nutrient pollution and development of a Bay-wide implementation strategy by 2000) and 1991 reevaluation (agreement requiring quantification of the original reduction goals, including "tributary nutrient load allocation"); 1992 amendment of 1987 Agreement (agreement requiring implementation of tributary-specific strategies to meet Bay water quality goals).

The *Chesapeake 2000* agreement commenced a new stage in Bay restoration. The region's jurisdictions, together with the EPA Administrator and the Chesapeake Bay Commission chairman, agreed to implement revised tributary strategies by 2002 and to reduce nutrient and sediment pollution sufficiently to remove the Bay and tidal tributaries from the § 303(d) list by 2010. In 2003, EPA and its watershed partners established nutrient and sediment cap loads on the basis of Bay water quality model projections and allocated those loads among the major river basins as implemented by the tributary strategies. In and around 2004, Virginia, Maryland, and Pennsylvania all passed legislation to create the Chesapeake Bay Commission to assist state legislatures in responding to problems relating to the Bay.<sup>28</sup> In 2004, as well, Virginia and the other six Bay jurisdictions developed what became known as the Chesapeake Bay Tributary Strategies which outlined river basin-specific implementation activities to reduce nutrients and sediment from point and NPS. The tributary strategies led to WLAs and LAs for the river basins that were set at levels very close to those recently stated in the Bay TMDL. In 2005, Virginia, Maryland, and Pennsylvania completed their Tributary Strategies for each major river basin.<sup>29</sup> In 2007, EPA and the Bay jurisdictions reevaluated the tributary strategy nutrient and sediment cap loads and found that sufficient progress had not been made.

---

<sup>28</sup> Va. Code § 30-240, and seq.

<sup>29</sup> *Chesapeake Bay Nutrient and Sediment Tributary Strategies* (2005, Commonwealth of Virginia).

While each of these endeavors may have yielded some benefits, they did not lead to removal of the Bay and tidal tributaries from Maryland or Virginia's list of impaired waters.<sup>30</sup> Bay waters were included on Virginia's 1998 § 303(d) list, giving rise to the Commonwealth's obligation under the CWA obligation to prepare a TMDL for those waters. Virginia never prepared such a TMDL. Instead, it requested that EPA do so<sup>31</sup> in accordance with a schedule established in a consent decree resolving the *American Canoe Ass'n, et al. v. EPA* litigation.<sup>32</sup> Propelled by *American Canoe*, other consent decrees, memoranda of understanding, and settlement agreements,<sup>33</sup> EPA commenced the process of preparing the TMDL, pursuant to CWA §§ 117(g) and 303(d), and current case law. Section 117(g) directs the EPA Administrator in coordination with the Chesapeake Executive Council to "ensure that management plans are developed and implementation is begun by signatories to the Chesapeake Bay agreement, to achieve and maintain...the nutrient goals of the Chesapeake Bay Agreement for the quantity of nitrogen and phosphorus entering the Chesapeake Bay and its watershed..."<sup>34</sup> The Bay TMDL, which sets sediments and Bay nutrient target loadings, is such a management plan.

In view of the decisions of Virginia and other Bay states not to establish TMDLs for impaired Bay waters as required by CWA 303(d), the fact that the impaired Bay waters constitute a multi-state system impaired by pollutant loadings from seven jurisdictions, and that EPA acts pursuant to the consensus direction of the Chesapeake Executive Council's Principals Staff Committee, EPA's decision to proceed with the TMDL is fully authorized.<sup>35</sup> Indeed, that decision embodies the directive in Executive Order 13508 that EPA "make full use of its authorities under the CWA."<sup>36, 37</sup>

#### **D. Virginia Is Required to Adopt an Adequate WIP that Meets the Bay TMDL Allocations and Provides Reasonable Assurances.**

The requirement that Virginia adopt an adequate WIP that implements the Bay TMDL, meets the Bay TMDL allocations, and includes reasonable assurances of point and nonpoint source pollution reductions is a crucial aspect of the Bay TMDL and its "accountability framework."

---

<sup>30</sup> In 1998, portions of the Chesapeake Bay and its tidal tributaries were identified as impaired for aquatic life uses and exceedance of the numeric criteria for dissolved oxygen caused by nutrient and sediment pollutants on Virginia's § 303(d) list. Other Bay and tidal tributary segments impaired by nutrients and sediment were identified on the § 303(d) lists of Maryland and the District of Columbia. See 74 FR 47792 (September 17, 2009).

<sup>31</sup> See Chesapeake Bay Program Principals' Staff Committee, 2007.

<sup>32</sup> E.g., Consent Decree, *American Canoe Ass'n, et al. v. EPA, et al.*, 54 F. Supp. 2d 621 (E.D. Va. 1999).

<sup>33</sup> See Settlement Agreement, dated May 10, 2005, *Fowler, et al. v. EPA*, Case No. 1:09-CV-0005-CKK (D.DC).

<sup>34</sup> 33 U.S.C. §1267 (g).

<sup>35</sup> See, e.g., *Scott v. City of Hammond*, 741 F. 2d 992 (7<sup>th</sup> Cir. 1984); *Dioxin/Organochlorine Center v. Clarke*, 57 F. 3d 1517 (9<sup>th</sup> Cir. 1995); *American Canoe Ass'n. v. EPA*, 30 F. Supp. 2d 908 (E.D. Va. 1998).

<sup>36</sup> The draft WIP suggests that Virginia was not a party to the *American Canoe Association* case consent decree. See draft WIP, at I. However, as shown above, Virginia was independently obligated to prepare an adequate implementation plan. Moreover, while the draft WIP (somewhat contradictorily) suggests that the May 2011 deadline in that decree should govern, the fact is, as shown above, Virginia had an independent obligation to adopt an adequate implementation plan to restore the waters of the Bay and tidal tributaries.

<sup>37</sup> Executive Order 13508, 74 Fed. Reg. 23099 (May 15, 2009).



The WIP is intended to fulfill several crucial components of the Bay TMDL framework.<sup>38</sup> Virginia is expected to meet, but not exceed, the Bay TMDL's total nutrient and sediment allocations to the Commonwealth and its basins, and to sub-allocate those limits among point and nonpoint source sectors and individual permitted sources within the area draining to each of the applicable § 303(d) segments in Virginia. Further, the WIP is expected to identify specific actions and controls to be 60 percent implemented by 2017 and 100 percent implemented by 2025. Specifically, the WIP must provide information concerning interim and final nutrient and sediment target loads; current loading baselines and program capacity (including current legal, regulatory, programmatic, financial, staffing, and technical capacity to deliver the target loads); ways growth will be addressed; gaps in program capacity; Virginia's commitment and strategies for filling the gaps; tracking and reporting protocols; contingencies for slow or incomplete implementation; and detailed targets or schedules.<sup>39</sup> Note that the EPA WIP guidance sets a standard that is very similar to that required for TMDL implementation plans in Virginia law.<sup>40, 41</sup>

The WIP, as a CWA implementation plan, is required to provide reasonable assurances that its allocations, including NPS allocations, will be achieved. The draft WIP asserts there is "some uncertainty" regarding the meaning of the term "reasonable assurance," and it suggests that the draft WIP's cursory references to "existing authority," "means of implementation," and to seeking "additional authority" will be sufficient to meet that requirement. EPA has issued a plethora of guidance on the subject that both confirms that reasonable assurances are the binding, enforceable, and/or incentive based tools that are included in an implementation plan to demonstrate that water quality goals will be attained and makes it clear that there is no "uncertainty" in this term that could justify any failure on Virginia's part to comply. For example, in 1991, EPA explained:

"Assurances may include the application or utilization of local ordinances, grant conditions, or other enforcement authorities. For example, it may be appropriate to provide that a permit may be reopened for a WLA which requires more stringent limits because attainment of nonpoint source load allocation was not demonstrated... State nonpoint source management programs may include, as appropriate, nonregulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects.<sup>42</sup> The TMDL is established so that the statutorily-required water quality standards are achieved, reasonable assurances must be given that the nonpoint source load allocations will be achieved."<sup>43</sup>

EPA's 1997 TMDL guidance, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)" further states, "It is now time to move towards the next stage of

---

<sup>38</sup> See EPA letter to Principals' Staff Committee, September 11, 2008.

<sup>39</sup> See Bay TMDL; see also correspondence from William C. Early, Acting EPA Regional Administrator to L. Preston Bryant, Virginia Secretary of Natural Resources (November 4, 2009); A Guide for EPA's Evaluation of Phase I Watershed Implementation Plans (April 2, 2010).

<sup>40</sup> See Va. Code §§ 62.1-44.19:5.C and D; 62.1-44.47.

<sup>41</sup> Va. Code § 62.1-44-19:8.

<sup>42</sup> See 1991 Guidance (emphasis added), at 6.

<sup>43</sup> *Guidelines for Reviewing TMDLs Under Existing Regulations Issued in 1992* (US EPA 1991a).  
[www.epa.gov/owow/tmdl/guidance/final52002.html](http://www.epa.gov/owow/tmdl/guidance/final52002.html).

our strategy to achieve water quality standards—to make sure that TMDLs are established for all listed waters, and that the load allocations established by TMDLs are implemented by point and nonpoint sources alike.”<sup>44</sup> The guidance continued by explaining that “reasonable assurances that the nonpoint source load allocations established in TMDLs (for waters impaired solely or primarily by nonpoint sources) will in fact be achieved. These assurances may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs.”<sup>45</sup> To the same effect is EPA’s 2002 document, “Guidelines for Reviewing TMDLs under Existing Regulations issued in 1991” which states for waters that are impaired by both point and nonpoint sources, “reasonable assurances that nonpoint source control measures will achieve expected load reductions [are required] in order for the TMDL to be approvable.”<sup>46</sup>

EPA has repeatedly clarified its expectations concerning “reasonable assurances.” By letter dated September 11, 2008, EPA provided the Chair of the Chesapeake Bay Program’s Principals’ Staff Committee with information about how EPA intends for the Bay TMDL to allocate nutrient and sediment loads and provide accountability for basin-wide reductions to meet water quality standards. This letter also included, in “Enclosure A,” detailed information concerning what the states were expected to provide by way of the reasonable assurance implementation framework for the Bay TMDL.

EPA offered a similar explanation in 2009, as the Bay TMDL process gathered momentum.<sup>47</sup>

“When EPA establishes or approves a TMDL that allocates loads to both point and nonpoint sources, it determines whether there is a ‘reasonable assurance’ that the nonpoint source load allocation will, in fact, be achieved and water quality standards be attained. EPA does this to be sure that the load allocations are not based on too generous assumptions regarding the amount of nonpoint source pollutant reductions that will occur. If the reductions embodied in load allocations are not fully achieved because of a failure to fully implement needed nonpoint pollution controls, the collective reductions from point and nonpoint sources will not result in attainment of the water quality standards.”<sup>48</sup>

Accordingly, the WIP will not be accepted by EPA as meeting applicable water quality standards unless the proposals it makes to reduce pollution loadings from nonpoint sources are clear and transparent, specific in their manner of effectuation, and enforceable through legislation, regulation, enforceable agreements, and appropriate and/or verifiable incentive programs. As shown below, Virginia’s current draft WIP falls far short of this requirement.

---

<sup>44</sup> *Id.*, at 1.

<sup>45</sup> *Id.*, at 6.

<sup>46</sup> “Guidelines for Reviewing TMDLs under Existing Regulations issued in 1991,” at 5.

<sup>47</sup> See EPA correspondence to then-Virginia Secretary of Natural Resources L. Preston Bryant, Jr. for the Chesapeake Bay Program’s Principals’ Staff Committee (November 4, 2009), at 15.

<sup>48</sup> *Id.*, at 5. See also U.S. E.P.A. (2002).

## ***II. Virginia's Draft WIP Does Not Meet the Bay TMDL Allocations or Include Reasonable Assurances Showing that Necessary NPS Pollution Reductions Will Be Achieved.***

The draft WIP does not conform to the requirements of the CWA. Most obviously, its nutrient allocations exceed the limits stated in the Bay TMDL for the James River that are necessary to meet the current chlorophyll *a* standard.

Equally important, the draft WIP does not provide reasonable assurances that the NPS reductions on which it relies to meet the Bay TMDL's allocations will be achieved. The draft WIP indicates the Commonwealth will "consider" or "explore" significantly expansion of a number of programs and practices that would be critical to achieving the reductions promised by the document, yet the document has not persuasively—or, in some cases, at all—explained how the expansions will be accomplished. Thus, the draft WIP relies to a significant degree on a barely-described proposal for a greatly enlarged nutrient credit exchange (NCE) as a way of meeting the nutrient and sediment reductions that are required by the TMDL. Indeed, the draft WIP repeatedly claims that the significant reductions promised for the urban runoff and on-site septic sectors "can be attained through expansion of the Virginia Nutrient Credit Exchange (NCE) program."<sup>49</sup> Although the program apparently would rely on nutrient credit purchases by the urban runoff and onsite septic system sectors,<sup>50</sup> nothing in the draft WIP describes what mechanism—whether regulatory or other—would create a demand for such credits. This issue is further discussed in **Section III**.

The WIP is strikingly devoid of necessary details concerning the how and when of possible changes in Virginia's regulatory and legislative frameworks that would be required to meet the reasonable assurances standard with respect to claimed nutrient reductions. A few of the many examples of this problem include the draft WIP's references to the onsite wastewater sector (noting the need to "consider revisions" to the Code of Virginia concerning new and replacement systems and requirements for additional nitrogen-reduction technologies)<sup>51</sup> and the urban runoff sector (noting the need to "consider controls" on non-agricultural lawn and turf fertilizers).<sup>52</sup> The lack of specificity is all the more disappointing given that the SAG members and agency staff put forward many thoughtful proposals to meet these gaps.

For other proposed reductions, the draft WIP asserts it will rely almost exclusively on voluntary measures, without enforcement or verification strategies, clear incentives, or regulatory drivers that could persuasively indicate the measures will be adopted and NPS reductions made. This strategy is especially striking in the context of the draft WIP's proposal to require 100 percent BMP implementation for urban runoff and onsite wastewater sectors and vastly increased agricultural BMP usage—yet these increases would be accomplished without mandates and without any detailed or plausible commitment on the part of the Commonwealth to increase

---

<sup>49</sup> See draft WIP, at 7, 9-10, 36-37.

<sup>50</sup> See draft WIP, at 4-6.

<sup>51</sup> See draft WIP, at 12.

<sup>52</sup> See draft WIP, at 13.



available funding.<sup>53</sup> As discussed throughout these comments, our position is that voluntary means will not suffice to meet the reasonable assurance requirement.

The deficiencies in the draft WIP cannot be excused by reference to any special provisions of Virginia law concerning implementation costs, as the draft WIP seems to suggest. As shown above, Virginia law requires conformity to the Section 303(d) program. Moreover, the Code section that prescribes implementation plans to address impaired waters provides no support for any idea that costs would justify delay in the development of an adequate implementation plan.<sup>54</sup>

Further, the draft “target loads” provided by EPA in November 2009 and the draft TMDL allocations released in July 2010 do not differ significantly from those published in the tributary strategies in 2005.<sup>55</sup> The Commonwealth has been in regular contact with EPA since 2005, participated actively in Chesapeake Bay Program committees (including the Principals Staff Committee, Executive Committee, and Water Quality Implementation Team), was a party to the decision for EPA to pursue a Bay TMDL in 2007, and worked closely with EPA over the last year to establish the draft WIP. Based on these facts we resolutely reject the WIP’s suggestion<sup>56</sup> that the allocations were unexpected or in any way impede the Commonwealth’s ability to develop a final WIP that meets the Bay TMDL.

As part of the draft Bay TMDL, EPA included its review of draft WIP-based applicable laws and regulations and the detailed EPA WIP guidance and concluded that the draft was “seriously deficient.”<sup>57</sup> The draft WIP’s numerous failures to provide reasonable assurances of nonpoint source reductions prevent EPA—and prevent the Commonwealth—from ascertaining whether the WIP will be able to meet water quality standards. The draft WIP cannot be approved in these circumstances. Thus, we concur with EPA’s conclusion that the draft WIP is “seriously deficient.” It neither meets the Bay TMDL’s allocations nor the requirements of CWA § 303(d) requiring reasonable assurances for NPS pollution reductions. CBF respectfully urges the Commonwealth to amend the draft WIP, in the manner detailed below, to address these deficiencies.

### *III. CBF Specific Recommendations for Improving the Draft WIP.*

In the attached **Exhibit 1**, CBF provides a number of recommended revisions to the “Accounting for Growth,” “Strategy to Fill Gaps,” and “Contingencies” sections of the draft WIP to address its two principal shortcomings discussed in the previous section: (1) it does not present sufficient pollution reductions to meet the TMDL allocations for TN and TP in the James River in 2017 or 2025, and (2) it lacks binding commitments to provide the program capacity needed to

---

<sup>53</sup> See draft WIP, at 60.

<sup>54</sup> Va. Code § 62.1-44.19:7.A.

<sup>55</sup> Letter from Shawn Garvin, EPA, Regional Administrator to Doug Domench, Virginia Secretary of Natural Resources. July 1, 2010.

<sup>56</sup> See draft WIP, at i (noting Governor McDonnell’s reference to “compressed timing”).

<sup>57</sup> Letter from William Early, EPA, Acting Regional Administrator to L. Preston Bryant, Virginia Secretary of Natural Resources. November 4, 2009; A Guide for EPA’s Evaluation of Phase I Watershed Implementation Plans. (April 2, 2010); Bay TMDL, Section 8.

give reasonable assurance that reductions in NPS pollution will be achieved and pollution from future growth will be prevented.

Recommendations to alleviate the key deficiencies in the draft WIP are provided for the four largest pollution source sectors: wastewater treatment plants (WWTPs), agriculture, urban runoff, and onsite wastewater systems (onsite systems). Comments and recommendations are not provided for the forest and resource extraction sectors. **Table 1** provides a brief summary of our recommendations described in more detail in **Exhibit 1**. Many of these recommendations were provided to the McDonnell Administration in a July 20, 2010 letter.<sup>58</sup> In addition, we include two brief additional sections that address the proposed expansion of the NCE and the use of two-year milestones to help meet TMDL goals. We also include some supplemental ideas for the WWTP sector if our specific recommendations prove untenable. Each recommendation includes (i) identification of the shortcomings in the draft WIP the revision will help address, (ii) a description of the revision, including the deadline for major actions, (iii) rough estimate of reductions in delivered TN and TP, if amendable to quantification without scenario builder or Bay modeling, and (iv) details of existing and new program capacity needed to implement the revision.

In narrowing down our list of recommendations, CBF focused on those that appeared realistic and achievable, are the most cost effective, attain better equity for citizens across river basins, and deliver additive benefits for local streams and communities. Some additional benefits could include nutrient reductions to streams that are scheduled to be subject to freshwater nutrient criteria beginning in 2013, recharge of groundwater sources, and assistance meeting other local water quality priorities (bacteria TMDLs, flood control, Municipal Separate Storm Sewer [MS4] permit requirements, etc.).<sup>59</sup>

Lastly, these recommendations are not presented as the *only* means to improve the draft WIP. There are surely many other ways to improve the draft WIP, some of which were discussed during the SAG meetings. Thus, these recommendations and the projected pollution reductions are not absolute by any means. Our intent in providing them is to broadly illustrate the wide range of options available to the Commonwealth for developing a final WIP that meets the Bay TMDL.

**Table 1: Summary of CBF Recommendations**

Key: TN=Total Nitrogen; TP=Total Phosphorus; lbs=pounds; and BAT=best available technology.

Source Sector	CBF Recommended Revisions	New Program Capacity Needed	Rough Estimate of Additional Pollution Reductions (if Available)
Wastewater Treatment Plants	(1) Require phased upgrades of 11 large WWTPs in the Lower James River to 5.0 mg/L TN and 0.3 mg/L TP by 2025.	-Revise regulations -New funding	3,810,000 lbs TN 519,000 lbs TP
	(2) Retire 5 percent of “nutrient credits” currently tied to excess WWTP capacity in the James River Basin by 2011.	-Revise regulations	572,000 lbs TN 50,000 lbs TP

<sup>58</sup> Letter to Doug Domenech, Virginia Secretary of Natural Resources from Ann Jennings, Virginia Executive Director, CBF, on July 20, 2010.

<sup>59</sup> DEQ. 2010. *Nutrient Criteria Development Plan for the Commonwealth of Virginia*. March 24, 2004 (with 2010 Updates).

**Table 1: Summary of CBF Recommendations**

Key: TN=Total Nitrogen; TP=Total Phosphorus; lbs=pounds; and BAT=best available technology.

Source Sector	CBF Recommended Revisions	New Program Capacity Needed	Rough Estimate of Additional Pollution Reductions (if Available)
	(3) Require upgrades by the largest existing non-significant municipal WWTPs by 2025.	-Revise regulations -New funding	278,000 lbs TN 40,000 lbs TP
	(4) Achieve reuse of 2 percent of municipal WWTP flow watershed-wide by 2017.	-New law -Create incentives	175,000 lbs TN 18,000 lbs TP
	(5) Require offsets of new nutrient pollution from small municipal and industrial WWTPs by 2011.	-Revise law	Offsets any new loads.
Agriculture	(1) Develop financial incentives to support enhanced agricultural BMP implementation by 2011.	-Expand funding -New incentives	Helps meet source sector allocation.
	(2) Expand regulatory drivers for BMP implementation in existing programs through 2025.	-Revise regulations	
	(3) Require livestock stream exclusion by 2017 for herds with greater than 20 head.	-New law	
	(4) Create a safe harbor provision for Virginia farms by 2011.	-New law -New regulations	
	(5) Expand enforcement programs by 2011.	-New funding	
	(6) Develop alternatives to land application of manures.	-New funding	
	(7) Reduce ammonia emissions from animal feeding operations.	-New regulations	Offsets any new loads.
	(8) Require offsets of new nutrient pollution loads.	-Revise law	
Urban Runoff	(1) Create a new state program to fund the retrofit of existing developed lands by 2011.	-New laws -Revise permits -New funding	Helps meet source sector allocation.
	(2) Establish aggressive, yet feasible, retrofit mandates in municipal sewer system permits by 2012.	-Revise permits	Helps meet source sector allocation.
	(3) Restrict the sale and application of fertilizer to turfgrass statewide by 2012.	-New law	455,000 lbs TN 123,000 lbs TP
	(4) Pursue several improvements to the Virginia Erosion and Sediment Control Program.	-New regulations -Revise permits	Helps meet source sector allocation.
	(5) Initiate an intensive campaign on what individual citizens can do to reduce stormwater pollution.	-New funding	Helps meet source sector allocation.
	(6) Require the offset of nutrient pollution from new development by 2012.	-New law	Offsets any new loads.
	(7) Establish regulations and incentives that promote redevelopment and sound land use.	-New law -New Incentives	
Onsite Septic	(1) Require existing onsite systems in sensitive areas to install BAT for TN or offset equivalent load by 2025.	-New law -New funding	Helps meet source sector allocation.
	(2) Require installation of BAT for all new and replacement septic systems within 1000 feet of sensitive areas by 2012.	-New law -New funding	Offsets any new loads.
	(3) Improve enforcement of the existing CBPA septic pump out provisions and expand provisions Bay watershed-wide by 2025.	-New law	Helps meet source sector allocation.
	(4) Prohibit new onsite systems in sensitive areas by 2012.	-New law	Helps meet source sector allocation.
	(5) Establish a financial assistance program for system improvements by 2012.	- New funding	Helps meet source sector allocation.



**Table 1: Summary of CBF Recommendations**

Key: TN=Total Nitrogen; TP=Total Phosphorus; lbs=pounds; and BAT=best available technology.

Source Sector	CBF Recommended Revisions	New Program Capacity Needed	Rough Estimate of Additional Pollution Reductions (if Available)
	(6) Require offsets from all new systems, with in-lieu payment option by 2011.	-New law	Offsets new loads
Expanded Nutrient Credit Exchange	(1) Establish appropriate regulatory drivers for expanded trading program by 2012.	-New regulations	Helps reduce existing and offset new loads.
	(2) Create an in-lieu fee offset program for small dischargers by 2012.	-New law	
	(3) Improve local water quality protections.	-Revised law	
Two Year Milestones	(1) Include details of 2-year milestones in final WIP.	None	n/a

#### *IV. Revised Pollution Allocations Consistent With CBF Recommendations.*

CBF proposes a revised set of TN and TP allocations for 2017 and 2025. Our suggested allocations only differ from the allocations put forward by the August 24, 2010 discussion document by reducing allocations for the WWTP sector in accordance with our recommendations. We call for significant pollution reductions from the James River basin, with some further effort spread across the remaining river basins. We did not include any lower NPS allocations than those proposed in August 2010 because we believe implementation of the types of recommendations we put forward can meet these goals. Reductions in NPS pollution beyond these levels would require more aggressive actions. Since they were created without use of the Bay watershed model or scenario building tool, these projected reductions are not presented as absolute, and are presented to illustrate potential options. **Tables 2** provides the 2025 pollution allocations included in the draft WIP, those put forward in the August 24, 2010 discussion document, and our proposed revised allocations. **Table 3** shows the anticipated 2017 progress under these same three allocation schemes.

Our recommendations result in a reduction in allocations to WWTPs by **5,257,769** pounds per year TN and **652,685** pounds per year TP. These reductions help:

- Overcome the TN pollution reduction shortfall in meeting the 2017 goals and 2025 TMDL allocations, and nearly overcome the TP reduction shortfall in meeting the 2017 and 2025 goals.
- Allow the allocations for the agriculture, urban runoff, and onsite system sectors to be increased consistent with the levels of treatment envisioned in the discussion document.

TN is reduced almost 1,000,000 pounds per year below the 2025 allocation in this analysis. This is because lower allocations were necessary to help meet the James River-specific allocations intended to meet the chlorophyll *a* criteria in the lower James.

**Exhibit 1** provides more detail and perspective about our reasoning for focusing on the WWTP sector and the James River basin, how we arrived at these estimates, and how they and

other options can replace and/or augment our recommended actions to fully achieve the 2017 and 2025 goals for both TN and TP.

**Table 2: Revised Virginia Chesapeake Bay TMDL Allocations [Million Pounds/Year]**

Source Sector	Draft WIP Allocations		August 24 <sup>th</sup> Document		CBF Allocations	
	<i>Nitrogen</i>	<i>Phosphorus</i>	<i>Nitrogen</i>	<i>Phosphorus</i>	<i>Nitrogen</i>	<i>Phosphorus</i>
Agriculture	16.391	2.146	14.35	2.080	14.350	2.08
Urban Runoff	3.915	0.380	6.00	1.020	6.00	1.02
Wastewater	20.394	1.832	20.030	1.730	15.134	1.179
Septic	1.922	0	2.370	0	2.370	0
Forest	13.939	1.090	13.939	1.090	13.939	1.09
Non-Tidal Dep.	0.612	0.058	0.612	0.058	0.612	0.058
Total	57.173	5.656	57.3	5.98	52.40	5.47
<b>TMDL Allocations</b>	<b>53.4</b>	<b>5.41</b>	<b>53.4</b>	<b>5.41</b>	<b>53.4</b>	<b>5.41</b>
<b>Overage</b>	<b>+3.77</b>	<b>+0.25</b>	<b>+3.90</b>	<b>+0.57</b>		<b>+0.06</b>

**Table 3: Revised Virginia Chesapeake Bay TMDL Allocations—2017 Target [Million Pounds/Year]**

Source Sector	Draft WIP Allocations		August 24 <sup>th</sup> Document		CBF Allocations	
	<i>Nitrogen</i>	<i>Phosphorus</i>	<i>Nitrogen</i>	<i>Phosphorus</i>	<i>Nitrogen</i>	<i>Phosphorus</i>
Agriculture	18.389	2.507	17.346	2.364	17.346	2.364
Urban Runoff	6.38	1.044	6.348	1.092	6.348	1.092
Wastewater	16.359	1.238	20.03	1.73	18.234	1.456
Septic	2.871	0	2.474	0	2.474	0
Forest	13.939	1.091	13.76	1.09	13.76	1.09
Non-Tidal Dep.	0.612	0.060	0.612	0.059	0.612	0.059
Total	58.55	5.940	60.57	6.447	58.94	6.061
<b>Progress by 2017</b>	<b>59.04</b>	<b>6.035</b>	<b>59.04</b>	<b>6.035</b>	<b>59.04</b>	<b>6.035</b>
<b>Overage</b>			<b>+1.53</b>	<b>+0.412</b>		<b>+0.026</b>

Since the majority of the cut in allocations is taken from WWTPs in the James River basin, in **Table 4 and 5** below we illustrate whether our recommendations similarly help meet the goals in the James. For both TN and TP, our suggestions help meet the 2017 goals and nearly meet the 2025 goals.

**Table 4: Revised James River Basin TMDL Allocations [Million Pounds/Year]**

Source Sector	Draft WIP Allocations		August 24 <sup>th</sup> Document		CBF Allocations	
	<i>Nitrogen</i>	<i>Phosphorus</i>	<i>Nitrogen</i>	<i>Phosphorus</i>	<i>Nitrogen</i>	<i>Phosphorus</i>
Agriculture	4.171	0.678	3.540	0.610	3.540	0.610
Urban Runoff	1.100	0.150	2.530	0.550	2.950	0.550
Wastewater	14.770	1.276	14.780	1.276	9.773	0.659
Septic	0.440	0.000	0.910	0.000	1.020	0.000
Forest	5.993	0.555	5.993	0.555	5.993	0.555
Non-Tidal Dep.	0.316	0.031	0.316	0.031	0.316	0.031
Total	26.790	2.690	28.069	3.022	23.6	2.405
<b>TMDL Allocations</b>	<b>23.480</b>	<b>2.340</b>	<b>23.480</b>	<b>2.340</b>	<b>23.48</b>	<b>2.340</b>
<b>Overage</b>	<b>+3.310</b>	<b>+0.350</b>	<b>+4.589</b>	<b>+0.570</b>	<b>+0.11</b>	<b>+0.065</b>

**Table 5: Revised James River Basin TMDL Allocations—2017 Target [Million Pounds/Year]**

Source Sector	Draft WIP Allocations	August 24 <sup>th</sup> Document	CBF Allocations
---------------	-----------------------	----------------------------------	-----------------

	<i>Nitrogen</i>	<i>Phosphorus</i>	<i>Nitrogen</i>	<i>Phosphorus</i>	<i>Nitrogen</i>	<i>Phosphorus</i>
Agriculture	4.680	0.800	4.302	0.61	4.302	0.754
Urban Runoff	2.700	0.563	2.698	0.55	2.698	0.590
Wastewater	11.441	0.775	14.780	1.08	11.539	0.714
Septic	1.110	0	0.954	0	0.954	0.000
Forest	5.993	0.556	5.993	0.57	5.993	0.570
Non-Tidal Dep.	0.316	0.030	0.316	0.03	0.316	0.030
Total	26.24	2.724	29.043	2.84	25.802	2.658
<b>Progress by 2017</b>	<b>26.24</b>	<b>2.724</b>	<b>26.24</b>	<b>2.724</b>	<b>26.24</b>	<b>2.724</b>
<b>Shortage/Overage</b>			<b>+2.083</b>	<b>+0.116</b>		

In sum, we believe the proposed revised allocations are equitable, realistic, and attainable, and our recommendations can assist in meeting them through 2025.

## *V. The Value of the Bay and Clean Waterways Across Virginia.*

The draft WIP and this comment have thus far discussed new actions, and potentially new costs, to deliver additional pollution reductions to the Bay and its rivers. There has been considerable discussion by the McDonnell Administration, stakeholders, and in the media about how much it will cost the state, businesses, and the people of Virginia to implement the WIP.

To put these costs in proper context, one must consider the other side of the equation—that clean water improves economic opportunities for all Virginians, through increased benefits to vital sectors of the economy that rely on our waterways and decreased burdens on businesses and citizens impacted by water pollution. In **Exhibit 2**, we provide extensive documentation on eight categories of benefits or avoided costs that demonstrate the value of the Bay and clean waters across Virginia. Here are several striking highlights of the exhibit to consider:

- Based on a 1989 study by the University of Maryland, an expert panel set the value of the Bay at over \$1 trillion, with an annual economic benefit of \$33 to \$60 billion.<sup>60,61,62,63</sup>
- A 2008 National Oceanic and Atmospheric Administration (NOAA) report said that commercial seafood industry in Maryland and Virginia contributed \$2 billion in sales and more than 41,000 jobs to the local economy.<sup>64</sup>
- Our crab report from 2008 calculated that between 1998 and 2006 crabbing-related jobs in Maryland and Virginia declined 40 percent, from 11,246 to 6,760.<sup>65</sup>

<sup>60</sup> Maryland Department of Economic and Employment Development. 1989. *Economic Importance of the Chesapeake Bay*.

<sup>61</sup> Chesapeake Bay Blue Ribbon Finance Panel. 2004. Saving a National Treasure: Financing the Clean up of the Chesapeake Bay. A Report to the Chesapeake Executive Council from the Chesapeake Bay Watershed Blue Ribbon Finance Panel.

<sup>62</sup> EPA. 2009. Draft Chesapeake Bay Compliance and Enforcement Strategy.

<sup>63</sup> Maryland Department of Natural Resources. [www.dnr.state.md.us/dnrnews/infocus/bay\\_faq.html](http://www.dnr.state.md.us/dnrnews/infocus/bay_faq.html). Visited July 22, 2010.

<sup>64</sup> NOAA 2008. 2008 Fisheries Economics of the U.S.

<sup>65</sup> CBF. 2008. *Bad Water and the Decline of Blue Crabs in the Chesapeake Bay*.



- Our 2010 oyster report states that the decline of the Bay oyster over the last 30 years has meant a loss of more than \$4 billion for Maryland and Virginia.<sup>66</sup>
- A recent study in Hampton, Virginia found that resident and non-resident boaters were responsible for \$55 million in economic impact and 698 jobs to this city.<sup>67</sup>
- A study by the Brookings Institute projected a 10 percent increase in property values for homes near a proposed \$26 billion Great Lakes restoration project.<sup>68</sup>
- Threats from sewage and bacteria forced Maryland and Virginia to close or restrict shellfish harvesting in 223,864 acres of the Bay and its rivers in 2008, eight percent of the total shellfish beds.<sup>69</sup>
- An EPA study of drinking water protection concluded that for every \$1 spent on source water protection, an average of \$27 is saved in water treatment costs.<sup>70</sup>
- A study by the University of Virginia concluded that over a five year period implementation of agricultural BMPs in line with the Virginia tributary strategies would create nearly 12,000 jobs and that every \$1 spent to implement BMPs generates \$1.56 in economic activity.<sup>71</sup>

When discussing the James River Strategy, the draft WIP states that the Commonwealth will be conducting a cost-benefit study to help inform the Phase 2 WIP process.<sup>72</sup> We urge the state to reflect upon the information in this section and consider the jobs, economic benefits, and foregone costs associated with clean water when preparing the final WIP and conducting future cost-benefit analysis to support WIP execution.

## **VI. Conclusions.**

CBF believes firmly that the draft WIP falls far short of meeting Virginia's obligations under its Constitution and state laws, and does not allow EPA to meet its own obligations under the Clean Water Act to create a Bay TMDL package that provides reasonable assurance that water quality standards will be achieved and maintained in the Chesapeake Bay and its rivers. We further believe that by creating a final WIP that includes the types of recommendations we describe that Virginia can chart its own course for meeting the Bay TMDL—something the majority of Virginians prefer.

---

<sup>66</sup> CBF. 2010. *On the Brink: Chesapeake's Native Oysters: What It Will Take to Bring Them Back*.

<sup>67</sup> Virginia Institute of Marine Science. 2009. *Assessment of the Economic Impacts of Recreational Boating in the City of Hampton*.

<sup>68</sup> J.C. Austin, et. al. 2007. *America's North Coast: A Benefit-Cost Analysis of a Program to Protect and Restore the Great Lakes*. Brookings Institute, Great Lakes Economic Initiative.

<sup>69</sup> Data from Departments of Health in Virginia and Maryland cited Chesapeake Bay Foundation. 2010. *On the Brink: Chesapeake's Native Oysters. What it will take to bring them back*.

<sup>70</sup> U.S. EPA. *Economics and Source Water Protection*. Presentation by Eric Winiecki, EPA.

<sup>71</sup> Rephann, T.J. 2010. *Economic Impacts of Implementing Agricultural Best Management Practices to Achieve Goals Outlined in Virginia's Tributary Strategy*. Weldon Cooper Center for Public Service, University of Virginia. February 23, 2010.

<sup>72</sup> See draft WIP, page 17.

There is no question that creating a WIP that provides reasonable assurance that the Bay TMDL will be met is not an easy task. If it were, we would have completed the work years ago. However, based on our respect for the skills and experience of the agency staff charged with composing the final WIP, we have high expectations that a much improved document will be submitted to EPA on November 29. Nonetheless, if the McDonnell Administration fails to improve the WIP, CBF supports EPA's proposal to shift more pollution reduction responsibilities to regulated point sources via the backstop TMDL, use its residual authority to address NPS pollution, and to assume a more direct role in the protection of our waters.

This is our generation's chance to make our mark and finish the job. We need to take it. It is far past time for all of us to make a real commitment to cleaning up the Bay and its 100,000 streams so we can stop passing on our pollution to the creek across the street, to our neighbors, to the businesses downstream, and ultimately, to our children.

Thank you again for the opportunity to comment on this critically important work for the people of Virginia. If you have any questions regarding these comments, please feel free to contact me at 804/780-1392 or at [mgerel@cbf.org](mailto:mgerel@cbf.org).

Sincerely,



Mike Gerel  
Virginia Senior Scientist

Attachments: EXHIBIT 1: DETAILED RECOMMENDATIONS FOR THE  
COMMONWEALTH OF VIRGINIA CHESAPEAKE BAY TMDL PHASE 1  
WATERSHED IMPLEMENTATION PLAN

EXHIBIT 2: THE VALUE OF THE CHESAPEAKE BAY AND CLEAN  
WATER ACROSS VIRGINIA

cc: The Honorable Douglas Domenech, Virginia Secretary of Natural Resources  
The Honorable Todd Haymore, Virginia Secretary of Agriculture and Forestry  
Anthony Moore, Assistant Secretary for Chesapeake Bay Restoration  
David Paylor, Director, Department of Environmental Quality  
David Johnson, Director, Department of Conservation and Recreation  
The Honorable Shawn Garvin, Administrator, EPA Region 3  
Jeff Corbin, Special Assistant to the Regional Administrator  
Roy Hoagland, Vice President for Environmental Protection and Restoration, CBF  
Jon Mueller, Vice President for Litigation, CBF  
Ann Jennings, Virginia Executive Director, CBF  
Beth McGee, Senior Regional Water Quality Scientist, CBF  
Peggy Sanner, Virginia Staff Attorney, CBF  
Kristen Hughes, Virginia Staff Scientist, CBF

**EXHIBIT 1:**

**DETAILED RECOMMENDATIONS FOR THE COMMONWEALTH OF VIRGINIA  
CHESAPEAKE BAY TMDL PHASE 1 WATERSHED IMPLEMENTATION PLAN<sup>1</sup>**

---

<sup>1</sup> *Chesapeake Bay TMDL Phase 1 Watershed Implementation Plan. Revision of the Chesapeake Bay Nutrient and Sediment Tributary Strategy. Public Review Draft. Commonwealth of Virginia. September 2010. Hereinafter “draft WIP.”*

## I. Wastewater Treatment Plants

### *Background*

Virginia has made significant progress over the last five years reducing nutrient pollution from 125 of the state's largest municipal and industrial WWTPs. These "significant dischargers" represent about 95 percent of the WWTP flow to the Bay from Virginia. Virginia adopted revisions to the Water Quality Management Planning Regulations (WQMPs) in 2005 that established enforceable annual TN and TP load limits (or "caps") for these large plants.<sup>2</sup> "Technology regulations" also adopted in 2005 set annual nutrient concentration limits for new and existing plants that exceed specified flow capacities.<sup>3</sup> In 2005 the General Assembly established the NCE to allow the exchange of nutrient credits between plants to help reduce costs and accelerate achievement of the caps and subsequent nutrient reduction goals.<sup>4</sup> A Watershed General Permit (WGP) was developed in 2006 to implement these new programs and establish a 2011 deadline for meeting the caps.<sup>5</sup> In addition, \$1.5 billion in state monies from the Water Quality Improvement Fund (WQIF) and Virginia Resources Authority (VRA) as well as federal assistance from the State Revolving Load Fund (SRLF) were provided over this period to help pay for plant upgrades.<sup>6</sup> Finally, to address future growth, the NCE law and a revision to that law in 2009, require a complete offset of any nutrient pollution from existing significant dischargers that expand and new plants that exceed 1,000 gallons per day (GPD).<sup>7</sup>

The new programs put in place over the last five years represent a substantial increase in program capacity. According to the Virginia Department of Environmental Quality (DEQ), these new efforts have specifically supported 44 plant upgrades and 46 nutrient exchange contracts, which are projected to deliver enough nutrient pollution reductions to meet the 2011 wastewater caps.<sup>8,9</sup> In total, these efforts are estimated to provide pollution reductions to the Bay of about 6,600,000 pounds TN and 580,000 pounds TP.<sup>10</sup> Note that using these same programs, up to 60 additional plant upgrades could take place after 2011 to help maintain the cap into the future.<sup>11</sup>

---

<sup>2</sup> 9 VAC 25-720.

<sup>3</sup> 9 VAC 25-40.

<sup>4</sup> Va. Code § 62.1-44.19.

<sup>5</sup> 9 VAC 25-820. General Permit for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia. January 1, 2007.

<sup>6</sup> See draft WIP.

<sup>7</sup> Va. Code §§ [62.1-44.19:14](#) and [62.1-44.19:15](#) (HB 1135, 2010).

<sup>8</sup> DEQ. 2010. PowerPoint Presentation. *Progress Report on Virginia Water Quality Improvement Fund—Point Source Nutrient Reductions in Chesapeake Bay Watershed*. January, 2010.

<sup>9</sup> See draft WIP.

<sup>10</sup> See [www.deq.state.va.us/bay/wqiflist.html#draft](http://www.deq.state.va.us/bay/wqiflist.html#draft).

<sup>11</sup> DEQ. 2010. PowerPoint Presentation. *Progress Report on Virginia Water Quality Improvement Fund—Point Source Nutrient Reductions in Chesapeake Bay Watershed*. January, 2010.

*Draft WIP*

The draft WIP sets the 2005 nutrient caps in the WQMP as the WLAs for this sector. In other words, *no additional* pollution reductions beyond the existing caps are required of any existing WWTP through 2025.

In trying to meet the TMDL allocations while forgoing additional reductions from WWTP, allocations for other sectors were set based on an “E3” level of treatment, or “everything, everywhere, by everyone,” for urban and septic source sectors. This level of treatment was included in materials for the SAG as a theoretical maximum amount of reductions that are possible, not as a level of effort that was realistic to expect from any source sector. EPA guidance was explicit that if a WIP relies on implementation approaching or beyond E3 levels that “EPA expects the Bay jurisdiction to provide documentation supporting the achievement of such an extraordinary level of effort.”<sup>12</sup> Although the WIP proposed E3 level of treatment for these sectors, the required documentation was not provided. Further discussion of the proposal to use E3 levels of treatment for the urban runoff and septic source sectors are provided later in this document.

Despite the inclusion of these completely unrealistic implementation levels for urban NPS sectors, the James River basin still failed to meet the 2025 TMDL allocations for TN by 3,300,000 pounds per year (lbs/year) and for TP by 350,000 pounds per year (lbs/year). The draft WIP addresses this shortfall by indicating that a poorly-described expansion of the NCE and/or a potential future revision of the chlorophyll *a* standard for the lower James River will allow the TMDL allocation to ultimately be met. CBF is on record with our opposition to the Commonwealth’s unjustified presumptions that the chlorophyll *a* standard will be loosened and the TMDL allocations for the James River will be increased.<sup>13</sup> The current chlorophyll *a* standard is *the* standard until it is formally changed via the Administrative Process Act—and the TMDL and WIP must be written to meet the current standard. We will plan to participate actively in public elements of the James River Chlorophyll Study or water quality standard revision process should either move forward.

Some strong programs are in place to address future growth in this sector. However, there are some gaps related to smaller facilities that need to be addressed. Offsets are currently not required for existing plants with a design flow less than 40,000 GPD that are expanding, but will still be under 40,000 GPD. Also not addressed are new municipal WWTPs under 1,000 GPD and industrial plants below 40,000 GPD. The draft WIP mentions both of these deficiencies, but does not commit to actions to address them.

Overall, the Commonwealth’s recent success cutting pollution by this sector and the decision to forgo further reductions from this sector and seek E3 reductions from other sectors,

---

<sup>12</sup> EPA. 2010. A Guide for EPA’s Evaluation of Phase 1 Watershed Implementation Plans. April 2, 2010.

<sup>13</sup> Letter from Bill Street, JRA and Ann Jennings, CBF to Alan Pollock, DEQ and Russ Perkinson, DCR dated 8/27/2010 regarding Virginia’s actions in support of the existing chlorophyll *a* standard for the James River.



leads us to draw *three* broad conclusions. We discuss these observations in detail below as they help form the basis for our recommendations for how to improve the draft WIP.

*First and foremost*, the draft WIP must be revised in such a manner to ensure that the TMDL allocations for the James River basin are met. The CWA prevents EPA from approving a TMDL that does not meet water quality standards.

*Second*, additional pollution reductions from this sector are feasible, reasonable, and cost-effective. These pollution reductions are absolutely critical to help erase the shortfall in the James River basin and help alleviate the lack of reasonable assurance in all basins for other source sectors. Our basis for this position is as follows:

- Wastewater has the strongest nutrient pollution reduction program capacity in place compared to the other sectors.
- Wastewater is the largest source of nutrient pollution to the James River, contributing half of the nitrogen and a third of the phosphorus pollution. Further, the wastewater flow to the James represents nearly half of the wastewater flow from Virginia to the Bay watershed.
- In parts of the Lower James River, chlorophyll *a* levels are highest during low flow conditions when wastewater discharges play a larger role compared to normal or high flow conditions. Given the large influence that wastewater flows have on the river during these times, further nutrient reductions from WWTP discharges must be part of the solution for meeting the spring/summer chlorophyll *a* standards in the tidal fresh and lower estuarine segments of this river.
- Pursuing further reductions from WWTPs that discharge to the lower James supports the dual goal of helping to meet the chlorophyll *a* standards in the lower river and to meet the dissolved oxygen and water clarity standards in the James and Bay main stem.
- WWTP remain one of the most cost effective nutrient pollution controls available. DEQ recently reported cost for the recent plant upgrades averaged \$6 per pound TN and \$15 per pound TP.<sup>14</sup> There is little question that many of the same citizens—the ratepayers—that are helping to pay for wastewater upgrades, will also end up helping to pay for measures to address the existing urban runoff and septic source sectors. Maximizing cost efficiency for these ratepayers should be paramount.
- The level of treatment required in the James River basin is less than what is being required of wastewater dischargers in other Virginia basins. For example, the annual average concentration limits used to set the caps in the WQMP in 2005 for plants in the James and York River basins (6.0-12.7 mg/L TN and 0.5-1.0 mg/L TP), were higher than the more stringent state-of-the-art (SOA) limits used for the Potomac, Rappahannock, and Eastern Shore basins (3.0-4.0 mg/L TN and 0.3 mg/L TP). Further, a provision in the Technology Regulation allows plants to operate above their “concentration base” if it is

---

<sup>14</sup> DEQ. 2010. *Cost of Point Source Credit for TN/TP—WQIF Projects*.

not necessary to meet their cap.<sup>15</sup> Therefore, the “effective” performance base for plants that discharge to the Lower James River in Hampton Roads ranges from better than biological nutrient removal (BNR, 5.0-8.0 mg/L TN) to less than secondary treatment (20.5 mg/L TN) for TN and BNR or less (1.0-1.5 mg/L TP) for TP. Thus, many of these plants could upgrade to provide anywhere from BNR to SOA treatment to provide additional pollution reductions and establish equitable requirements for plants across river basins.

- As of 2009, WWTPs in Virginia that discharge to the Bay watershed were using only 65 percent of their design capacity to set the caps in the WQMP in 2005.<sup>16</sup> This large excess capacity has allowed plants to operate far above their concentration base. These design flows were calculated in 2004 during one of the largest land development booms in Virginia’s history. Therefore, it is fair to question whether this capacity truly represents that which is realistically needed by communities for expected economic development in the near future.

*Third*, the same approach used to deliver pollution reductions from the wastewater sector should be used as a blueprint for achieving more assured reductions from the NPS sectors. The accomplishments of this sector provide clear evidence that significant pollution reductions result when reasonable assurance is provided, in this case, through strong mandates, including a reasonable compliance schedule; significant public funding; and market-based incentive programs. These same steps are necessary if existing NPS reductions are to be realized.

### *Recommendations*

Based on our conclusions above, we offer **five** specific recommendations for revisions to the draft WIP with respect to WWTP wasteload allocations. These actions are intended to provide significant additional pollution reductions to help achieve the spring/summer chlorophyll *a* standards in both lower James segments, assist with achieving TMDL goals in the James for both 2017 and 2025, and provide additional reductions to assist in providing a higher level of reasonable assurance that revised pollution allocations in **Section IV** for the entire Virginia Bay watershed can be met. Additional feasible options for achieving more pollution reductions from large WWTPs are provided at the end of the first recommendation. As noted previously, our recommendations are not the only means to improve the draft WIP; the list of recommendations we present are intended to show the wide range of options available to the Commonwealth to meet the TMDL goals.

#### *(1) Require phased upgrade of 11 large plants in the Lower James River by 2025.*

The Commonwealth should require that eleven of the largest municipal WWTPs that discharge to the Lower James River between Chesterfield County and the mouth of the James

---

<sup>15</sup> 9 VAC 25-40-70.A.4.

<sup>16</sup> See draft WIP.

River upgrade to achieve a 5.0 mg/L TN and 0.3 mg/L TP by 2025.<sup>17</sup> We used a step-wise approach to select WWTPs for upgrade. First we focused on several larger municipal plants that have WLAs based on TN concentrations that exceed BNR treatment for TN (several even approached secondary treatment). This strategy would bring the performance of these very large municipal WWTPs more in line with the performance required of comparable plants in the other river basins. Then we selected municipal WWTPs that have a design flow of 20 MGD or more. We also looked to balance reductions from WWTPs that discharge to both the tidal fresh and lower estuary of the James. And lastly, we took into consideration whether plants had very recently completed an upgrade and deferred those plants for further upgrades until 2025.

Note that this analysis focuses on what plants are authorized to discharge in the WGP and WQMP, in other words, their TN/TP concentration basis and design flow used to set their WLAs in 2005, the most current information available to the public. The best way to approximate potential future reductions in delivered pollution was to only include reductions from installation of new technology that improves upon the TN/TP concentration basis. The current significant excess flow capacity—and the higher TN/TP concentrations it can allow—precludes using current flow and performance to draw meaningful conclusions about what additional pollution reductions may be available in the future. Therefore, this recommendation focuses on what *could* be discharged under an individual WWTP permit, not what the plants are *choosing* to discharge today.

Also be aware that we do not have access to the Bay model or scenario builder, so the pollution reductions projected here are estimates. They are solely intended to illustrate that options are available *between* the approach taken in the draft WIP of not pursuing any further WWTP upgrades through 2025, and the EPA backstop that seeks upgrades by all significant WWTPs that discharge to the Bay to 4.0 mg/L TN and 0.3 mg/L TP. Further, use of the NCE, exchange of TN and TP allocations, and other strategies may allow some of the proposed upgrades to be unnecessary. The absolute bottom line is that for the final WIP to be acceptable it must include a mix of upgrades and other strategies that meet the TMDL allocations.

To first allow a full accounting of new reductions that can be anticipated, **Table 1** describes the two Lower James River plant upgrades that are already funded and scheduled to come on-line by 2013 that improve upon the TN/TP concentration performance. It is our understanding based on discussions with DEQ staff that these reductions are not yet counted by EPA as progress through 2009. It is our further understanding that these projected reductions have been considered by the Commonwealth when it states that the overall 2011 goal for WWTPs will be met.

---

<sup>17</sup> Based on its significant industrial influent that may contain significant soluble TN, we included an upgrade to 8.0 mg/L TN for the Hopewell WWTP.

**Table 1—Lower James River WWTP Upgrades Anticipated Through 2013**

Plants	Current TN Annual Average Concentration Base for WLAs	Upgrade TN to	Rough Delivered Reductions Provided (lbs/yr)	Deadline
Proctors Creek	6.3	5.0	83,703 TN	2012
HRSD-Army Base	11.2	5.0	336,000 TN 26,000 TP	2013
<b>Totals:</b>			<b>420,000 TN 26,000 TP</b>	

**Table 2** summarizes the additional upgrades recommended to further improve upon performance through 2025.

**Table 2—Proposed Lower James River WWTP Upgrades Through 2025**

Plants	Current TN Annual Average Concentration Base for WLAs	Upgrade TN to	Current TP Annual Average Concentration Base for WLAs	Upgrade TP to	Rough Delivered Pounds/Year Reductions Provided (lbs/yr)*	Potential Phasing
Richmond	8.0	5.0	0.5	0.3	411,045 TN 27,404 TP	2025
Proctors Creek	n/a	n/a	0.65	0.3	21,468 TP	2025
Henrico	n/a	n/a	0.5	0.3	45,673 TP	2025
Hopewell	12.0	8.0	0.5	0.3	608,923 TN 30,449 TP	2017
South Central	n/a	n/a	0.5	0.3	14,006 TP	2025
HRSD Boat Harbor	9.7	5.0	1.0	0.3	359,246 TN 53,294 TP	2017
HRSD James River	20.5	5.0	1.0	0.3	945,397 TN 42,635 TP	2025
HRSD Williamsburg	11.7	5.0	1.0	0.3	457,321 TN 47,964 TP	2017
HRSD Nansemond	8.3	5.0	1.0	0.3	63,953 TP	2017
HRSD-VIP	n/a	n/a	1.0	0.3	293,095 TN	2025
HRSD Ches-Eliz	15.0	5.0	1.5	0.3	85,270 TP 734,476 TN 86,743 TP	2025 2017
<b>Totals:</b>					<b>3,810,000 TN 519,000 TP</b>	

\* Lesser reductions may result if excess design flow is retired as discussed in the second WWTP recommendation.

We estimate that upgrading these eleven significant WWTPs by 2025 can achieve the basin-wide TMDL allocations for the James in 2017 and 2025 and the revised Virginia Bay watershed-wide allocations called out in **Section IV**. However, there are an array of strategies to achieve further reductions from WWTPs. The following strategies may also be workable:

- Require upgrades to significant WWTPs that discharge to the lower James River such that all plants achieve 4.0 mg/L TN and 0.5 mg/L TP. This would require 14 plants to upgrade their TN treatment and seven plants to improve TP performance. Reductions in



pollution delivered to the Bay could be reduced by approximately 5,253,000 lbs TN and 245,126 lbs TP.

- Mandate upgrades such that all significant WWTPs watershed-wide achieve 4.0 mg/L TN and 0.3 mg/L TP. This approach would be consistent with the proposed EPA back-stop action for WWTPs.
- Require upgrades such that all significant WWTPs watershed-wide achieve 3.0 mg/L TN and 0.3 mg/L TP.
- Require upgrades of significant WWTP plants to 3.0-4.0 mg/L TN and 0.3 mg/L TP that serve Phase 1 MS4 communities or both Phase 1 and 2 MS4 communities.
- Require upgrades of plants in the York River basin from 6.0 mg/L TN and 0.5 mg/L to at least 5.0 mg/L TN and 0.3 mg/L to achieve nutrient treatment more consistent with WWTPs in the other river basins.

The existing Virginia Pollutant Discharge Elimination Program (VPDES) and NCE program are in place to help facilitate these recommended upgrades. However, regulatory changes and significant funding will be needed to accomplish these recommendations. Existing funding for WWTP upgrades is already \$130 million in arrears, so existing past funding allocations are not available to support new programs.<sup>18</sup>

The new WLAs necessitated by these upgrades would need to be included in the next WGP due by January 1, 2012 and in the WQMP.<sup>19</sup> We recognize that meeting this requirement might be logistically challenging for some WWTPs. However, to advance the type of pragmatic upgrade schedule listed above to help meet these new WLAs in light of the existing regulatory guidelines regarding compliance within the VPDES permit cycle, Virginia could propose the development of a permit for only those WWTPs subject to a chlorophyll *a* standard, subject to public notice and comment and followed by a judicially enforceable agreement, that includes a binding compliance schedule that will meet the requirements set forth in the new Bay TMDL by 2025.

Obtaining consistent financial assistance from the legislature to pay for mandated upgrades through 2025 is absolutely critical. General Fund appropriations, bond authority, and other options are needed. A high cost-share percentage (at least 60 percent) will also be vital to ensure an equitable cost-sharing between state and locality budgets. The Commonwealth could consider prioritizing funding to WWTP projects that are upgrading nutrient treatment capabilities or expanding to take smaller plants, onsite systems, or other pollution sources (landfills, for example) off line, over projects that are only expanding capacity to support future development. WWTP pollution reductions are supported by strong existing program capacity (in terms of regulatory mechanisms, staffing, and tracking), are some of the most cost-effective available, are supported by millions of rate payers, and create well-paying construction and engineering jobs.

---

<sup>18</sup> DEQ. 2010. PowerPoint Presentation. *Progress Report on Virginia Water Quality Improvement Fund—Point Source Nutrient Reductions in Chesapeake Bay Watershed*. January, 2010.

<sup>19</sup> 9 VAC 25-31-250.

While year-by-year funding of nearly \$1 billion via the General Fund and bond packages has carried the program since the late 1990s, pursuing a consistent funding source would provide better surety to local WWTPs that are asked to carry increased pollution reduction responsibilities.

The NCE also has the potential to help accomplish these reductions faster and at lesser costs. A full discussion of an expanded NCE is provided later in this section.

*(2) Retire five percent of existing “nutrient credits” currently tied to excess capacity in WLAs for WWTPs in the James River Basin by 2011.*

Virginia should permanently retire five percent of the existing “nutrient credits” tied to the currently unused flow capacity from all 27 municipal WWTPs in the James River basin. This action will provide an immediate reduction in authorized delivered nutrient pollution by **572,000 lbs/yr TN** and **50,000 lbs/yr TP**. Again, focusing reductions on the James Basin can further help ensure adequate reductions are provided to meet the chlorophyll *a* standard. Other options include retiring five percent of the nutrient credits tied to excess flow watershed-wide (delivering pollution reductions of approximately 1,940,000 lbs TN and 177,000 lbs TP) or retiring ten percent of the nutrient credits tied to excess flow Virginia Bay watershed-wide (approximately 948,000 lbs TN and 88,000 lbs TP).

CBF is aware that WWTP capacity is a significant local tool used to attract economic development, and the prospect of pulling back existing WLAs may not appear immediately attractive, or even fair. Keep in mind that should this capacity—or additional capacity—be needed by localities in the future as the economy recovers, the NCE was specifically created to help accommodate future WWTP pollution loads. Any expansions to the NCE, including additional authorities and mandates to compel buying and selling, are likely to be complete by the time the retired capacity is needed.

Revisions to the next WGP and WQMP would be necessary to achieve these reductions. Any permanent reductions in design flow, and resultant reduction in WLAs, provides pollution reductions at no new costs to the Commonwealth. Using new funding sources to pay for WWTP upgrades and forestalling use of these existing nutrient credits now, is akin to borrowing money from a friend to pay a debt when you have sufficient money in your bank account to pay the debt. If the Commonwealth is serious about pursuing the most cost-effective solutions, immediately retiring a modest amount of existing nutrient credits is a useful approach.

*(3) Require upgrades by the largest existing non-significant municipal WWTPs by 2025.*

The Commonwealth should require upgrades of existing non-significant WWTPs that discharge greater than or equal to 200,000 GPD to achieve to BNR. This would require 37 plants to achieve 8.0 mg/L TN and 1.0 mg/L TP by 2025. These plants are all above the fall line, as plants below the fall line that discharge more than 100,000 GPD already must meet more stringent treatment standards. A plant that treats this volume of wastewater is not small; it

supports approximately 2,000 households. We believe it is more than appropriate to ask these large non-significant plants to upgrade some time in the next 15 years. Further, this action will benefit the Bay, and will also help comply with existing and planned mandates to improve water quality in local streams. For example, nutrient criteria for freshwater streams are scheduled to be promulgated by 2013 for wadeable streams and 2014 for non-wadeable streams.<sup>20</sup>

**Table 4** below describes the plants that should upgrade and a rough estimate of nutrient pollution reductions that can be realized through the upgrades.

**Table 4—Upgrades by Largest Non-significant Dischargers**

Facility Name	Flow (MGD)	Delivered TN Reductions (lbs/yr)	Delivered TP Reductions (lbs/yr)
Boston Water and Sewer STP	0.45	8947	1254
Culpeper County Industrial Airpark STP	0.3	3031	1371
Zion Crossroads WWTP	0.7	13917	1951
McGaheysville STP	0.499	7156	1003
Summit STP	0.32	7717	1081
Appomattox Water Reclamation Facility	0.3	5964	836
Virginia Correctional Center for Women	0.3	7822	1097
Dept of Corrections, Fluvanna Correctional Center	0.3	5964	836
Wintergreen Mountain	0.3	5964	836
Stanley STP	0.49	10700	1500
DOC - Buckingham Correctional Center	0.3	5964	836
Amelia County Sanitary District	0.999	12373	1735
Thornburg Community STP	0.345	11244	1576
Bierer STP	0.35	7643	1071
Camelot STP	0.365	7257	1017
Shenandoah STP	0.4	8735	1225
Grottoes STP	0.4	5736	804
Louisa Regional STP	0.4	7953	1115
Craigsville STP	0.435	6238	875
Hot Springs Regional STP	0.65	6356	891
Glasgow STP	0.495	4840	679
Greens Corner WWTP	1.5	29822	4181
Four Winds Campground STP	0.21	6844	960
Buckingham Co Water System/Dillwyn STP	0.2	3976	557
Land Or Utility WWTP	0.22	7170	1005
Scottsville STP	0.2	3976	557
Meadowbrook WWTP	0.2	3976	557
James River Correction Center	0.216	5632	790
Nelson County Regional STP	0.22	4374	613
Buchanan STP	0.2375	2322	326
Bowling Green WWTP	0.25	8148	1142

<sup>20</sup> DEQ. 2010. *Nutrient Criteria Development Plan for the Commonwealth of Virginia*. March 24, 2004 (with 2010 Updates).

Middletown STP	0.25	6029	845
Lovettsville Town WWTP	0.25	6763	948
Crooked Run STP	0.25	6030	845
George Mason University - Conference Center	0.25	8148	1142
Greenville WWTP	0.25	6519	914
Dutoy Creek WWTP	0.25	6519	914
	<b>14.1</b>	<b>277,769</b>	<b>39,885</b>

Amendments to the WQMP and Technology Regulation would be necessary to achieve these reductions. Further, a consistent source of financial assistance from the legislature to pay for mandated upgrades through 2025 is essential. A high cost-share percentage (at least 75 percent, if not more) will be needed, as most of these plants are operated by small towns.

*(4) Install infrastructure to reuse two percent of municipal WWTP flow by 2017.*

The state should create statewide incentives via the Code to facilitate the installation of infrastructure and nutrient management plan (NMP) implementation to support reuse of least two percent of Virginia Bay watershed-wide municipal flow. Based on a total municipal WWTP flow of 585 MGD and annual average concentration limits of 5.0 mg/L TN and 0.5 mg/L TP, reuse of 11.7 MGD could generate pollution reductions of **178,000 lbs/yr TN** and **17,800 lbs/yr TP**.

Wastewater reuse is particularly important in areas of the state that are vulnerable to drought conditions. Wastewater could be directed for irrigation of golf courses, recreational fields, and open spaces, as well as use for cooling water or other industrial uses. Any reuse as irrigation must be applied in accordance with NMP requirements to ensure zero discharge of nutrients to ground or surface waters. Any nutrients discharged in excess of NMPs or that pass through an industrial process must be removed from the reduction created.

As costs to install and maintain pipes and pump stations to relocate reuse water can be a considerable barrier, changes to the Code would be required to authorize grants, low interest loans, business tax credits, and/or the authority for localities to offer their own tax credits, fee waivers, or other incentives to compel interest. Efforts to pursue this level of reuse should be pursued immediately, perhaps through targeted incentives and outreach to golf courses.

*(5) Require offsets of new nutrient pollution from small municipal and industrial WWTPs.*

The Commonwealth should require nutrient pollution offsets from new municipal WWTPs that discharge less than 1,000 GPD (usually single-family homes) and new industrials that discharge less than 40,000 GPD. This action will help ensure that the aggregate load from new and expanding residential development and industry will not erase progress elsewhere. Amendment of the nutrient NCE law would be required to accommodate this new requirement. It may be appropriate to create an in-lieu fee component of the trading program to collect a standard fee to mitigate the smaller pollutant loads generated by these sources, as well as on-site



septic loadings discussed later in this section. An expanded NCE is discussed later in this section.

### *Conclusion*

EPA's "backstop" allocations include upgrades to 4.0 mg/L TN and 0.3 mg/L TP by all 39 municipal and industrial WWTPs in the James River basin. Virginia has the flexibility to pursue the modified approach outlined in the preceding section that we believe provides additional pollution reductions that are feasible, equitable, and cost-effective. Types of actions recommended in this section may be preferable to the region-wide approaches available to EPA.

## **II. Agriculture**

### *Background*

Over the past few decades, Virginia farmers have made significant progress in reducing nonpoint source pollution from agriculture by installing BMPs. One of the most promising aspects of on-farm conservation in Virginia has been the success of federal and state cost-share programs in driving BMP implementation. Farmers have consistently demonstrated the willingness to invest their own resources to install BMPs when cost-share funding is available. Despite historic levels of funding for the federal cost-share programs in Virginia, there is still a backlog of applications. Additionally, there are many farmers who choose not to participate in cost-share programs but who do install BMPs using their own financial resources.

Also, Virginia has a strong history of collaboration amongst stakeholders to develop innovative projects that include demonstrating new technologies, as well as projects designed to accelerate BMP implementation in targeted watersheds and in targeted communities. These efforts are delivering additional financial and technical resources to farmers and demonstrating innovative technologies and practices such as: demonstration of an on-farm portable pyrolysis unit that converts poultry litter to bio-oil, delivery of on-farm technical assistance and private funding resources to the Old Order Mennonite communities for BMP implementation; and delivery of technical assistance and equipment to help farmers better utilize fertilizer and avoid over-application.

However, despite these efforts, Virginia still has a long way to go to reduce nutrient and sediment runoff from agriculture to acceptable levels. The draft agriculture scoping scenario 2008 implementation levels presented to the agriculture work group on July 8, 2010, illustrates that for practices considered high priority, implementation levels as of 2008 are far below the proposed goals.<sup>21</sup> Although this estimate currently does not include data on voluntary BMPs (i.e. paid for without federal or state cost-share information), the data on BMP implementation using cost-share funds indicates agriculture still has a long way to go. For example, forest or grass

---

<sup>21</sup> Commonwealth of Virginia. July 8, 2010. Virginia Chesapeake Bay TMDL WIP DRAFT Agriculture Scoping Scenario Implementation Levels.

buffers of at least 35 feet or more have been installed on just nine percent of cropland, 16 percent of pasture acreage, and zero percent of hay acreage.

While CBF supports the effort currently underway, as directed by 2010 Senate Bill 346 and Code amendments to 2.2-220.3, to establish a program for tracking BMPs installed without cost-share funding, even when these voluntary practices are enumerated, it is likely that the data will reflect we have a way to go towards meeting agriculture nutrient and sediment reduction goals.

A recently released draft report from the U.S. Department of Agriculture (USDA) assessing the effects of conservation on cultivated cropland in the Chesapeake Bay watershed (USDA 2010 Report) further illustrates that existing programs have not made near enough progress in protecting water quality.<sup>22</sup> This report considered all conservation practices currently implemented, including practices implemented voluntarily, without federal or state cost-share assistance. The report found that 81 percent of harvested cropland in the Bay watershed lacks some or all conservation measures necessary to reduce nutrient and sediment loss to tolerable levels. The report also found that 81 percent of harvested cropland failed to meet nutrient management planning goals for rate, timing, and placement of fertilizer application. Lack of NMP development and implementation, and subsequent excessive loss of fertilizer nutrients, costs Virginia farmers millions of dollars in lost revenue every year. While soil erosion control practices are widespread, 26 percent of crop land still has excessive sediment loss from fields and requires additional erosion control practices. Existing programs have also failed to protect lands most vulnerable to nutrient and sediment loss—47 percent of land in the watershed is considered highly vulnerable to pollution and is classified as “critically undertreated.” While existing programs have made some progress, it is unreasonable to expect they will achieve necessary agricultural nutrient reduction goals.

#### *Draft WIP*

The draft WIP proposes ambitious goals for widespread implementation of BMPs on farms. For example, the draft WIP proposes 90 percent implementation levels for riparian buffers on cropland, pasture, and hay acreage by 2025. Implementation of NMPs on cropland is anticipated to increase from 51 percent to 95 percent, and no-till farming is projected to increase from 55 percent to 90 percent by 2025.

The agricultural sector section of the draft WIP relies almost exclusively on existing programs and authorities in addition to a new “expectation” that farmers will widely adopt BMPs, without any concrete drivers proposed to accomplish these ambitious goals. There are no estimates of cost-share funding needed to achieve the proposed reduction, nor is there a plan to secure the funding. The draft WIP also lacks new program capacity—the proposed rules, regulations, permits, or other enforceable, binding measures—to achieve the proposed pollution

---

<sup>22</sup> U.S. Department of Agriculture. 2010. *Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Chesapeake Bay Watershed*.

reduction goals. There is also no schedule for implementation, including no two-year milestone goals.

### *Recommendations*

Below we recommend **eight** specific revisions to the agriculture section of the draft WIP that will help provide a high level of reasonable assurance that the revised pollution allocations for the agricultural sector in Section IV will be met. Note that these allocations are set based on a Level 3 level of effort included in the August 24, 2010 SAG discussion draft.

*(1) Develop financial incentives to support enhanced agricultural BMP implementation by 2011.*

The availability of cost-share funding is a critical component for the agricultural community to achieve BMP implementation goals. As such, the WIP should include an estimate of the total cost to fund the Virginia Agricultural BMP Cost-Share Program to levels sufficient to ensure adequate cost-share is available for implementation of the practices proposed in the WIP. Also, the WIP should include a plan for securing these funds including legislative proposals.

According to the 2009 report prepared by the Virginia Department of Conservation and Recreation (DCR)<sup>23</sup> (based on the tributary strategy BMP implementation goals), annual funding needs for the Virginia Agricultural Cost-Share Program over the next 15 years total \$1,123,000,000, statewide. Of this total, eight percent will support Soil and Water Conservation District (SWCD) technical assistance, 55 percent will support agricultural BMPs in the Chesapeake Bay basin, and 37 percent will support BMPs in the Southern Rivers. Funding estimates for agriculture BMPs in the Chesapeake Bay watershed total approximately \$620 million and are listed by year in **Table 3**.

**Table 3--Chesapeake Bay Watershed Ag BMP Cost-share Funding Projected Needs\***

FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
\$22**	\$24.3	\$26.6	\$31.2	\$33.9	\$36.1	\$38.4	\$40.7	\$43	\$54	\$54	\$56.3	\$58.6	\$60.9	\$63.2

\*Based on 2009 report and since FY11 was not funded at recommended level, numbers will need to increase over the following 15 years. An updated 2010 report should be available in mid-November. Also, numbers may change when the Virginia TMDL Watershed Implementation Plan is finalized. Additional funding from the federal Farm Bill will likely reduce these numbers.

\*\*Does not include additional \$5.4 million necessary to meet 2011 milestone. With milestone needs included, total need for FY11 would be \$27.4 million in the Chesapeake Bay watershed.

These funding levels include the funding needed to accomplish levels of reduction from nutrient management planning and implementation on 90 percent of cropland and hayland in the Chesapeake Bay watershed. This level of implementation reflects what would be accomplished if NMPs were developed and implemented on all farms that apply fertilizer or manure to more than 100 acres.

<sup>23</sup> Commonwealth of Virginia. 2009; *Annual Funding Needs for Effective Implementation of Agricultural Best Management Practices*.

In addition to traditional cost-share, CBF recommends an expansion of the Virginia tax credit program to include transferable tax credits similar to the Pennsylvania Resource Enhancement Program (REAP).<sup>24</sup> Producers often owe few, if any, state taxes. The REAP program allows farmers to sell tax credits to other tax payers, similar in concept to the Virginia conservation easement tax credit program outlined in the Virginia Land Conservation Incentives Act of 1999.<sup>25</sup> This would require new legislation. CBF recommends capping the proposed transferable tax credit program at \$10 million per year.

CBF also supports the promising idea in the draft WIP to consider amending §58.1-323.1 to require certain BMPs to be used on land enrolled in local use value assessment and taxation programs. These practices should include: implementation of soil conservation and nutrient management plans, establishment of 35-foot or greater permanent grass or riparian buffers, livestock stream exclusion, and if applicable, appropriate barnyard management.

*(2) Expand regulatory drivers for BMP implementation in existing programs through 2025.*

Currently, the only water-quality related regulatory drivers governing Virginia agriculture apply to:

- Confined animal feeding operations (CAFOs) with more than 200 animal units of poultry or 300 animal units of livestock and liquid manure systems (Virginia Pollution Abatement Permit Regulation<sup>26</sup>);
- Fields receiving biosolids (Biosolids Use Regulations<sup>27</sup>); and
- Farms in regions covered by the Chesapeake Bay Preservation Act (CBPA) Regulations.<sup>28</sup>

We recommend the following changes to these existing regulatory programs to provide additional program capacity to deliver nutrient pollution reductions.

(a) Virginia Pollution Abatement Permit for Livestock Animal Feeding Operations

According to the 2007 National Agricultural Statistics Survey, there are over 1,100 dairies operating in Virginia and only 80 of them are currently covered by Virginia Pollution Abatement (VPA) permits for animal feeding operations.<sup>29</sup> We recommend expanding coverage to facilities with herd sizes greater than 100 animals by 2017 (which would cover approximately 34 percent of Virginia dairies), and 50 animals by 2025 (covering approximately 55 percent of

---

<sup>24</sup> Pennsylvania Department of Agriculture Resource Enhancement and Protection (REAP) description: [http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS\\_0\\_2\\_24476\\_10297\\_0\\_43/AgWebsite/ProgramDetail.aspx?name=Resource-Enhancement-and-Protection-\(REAP\)-&navid=12&parentnavid=0&palid=22&](http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/AgWebsite/ProgramDetail.aspx?name=Resource-Enhancement-and-Protection-(REAP)-&navid=12&parentnavid=0&palid=22&)

<sup>25</sup> Va. Code §58.1-510 et seq.

<sup>26</sup> 9 VAC 25-32-10.

<sup>27</sup> 12 VAC 5-585-10 et seq.

<sup>28</sup> Va. Code §10.1-2100 et seq.

<sup>29</sup> 9 VAC 25-192-10 et seq.



Virginia dairies). Developing a general permit for smaller facilities would require legislative change to the existing code (Chapter 32, Virginia Pollution Abatement Permit Regulation).

Expanded VPA coverage for smaller dairies will address barnyard management issues, as well as ensure manure is land-applied appropriately. The importance of manure management is illustrated by the USDA 2010 Report that found that 70 percent of the acreage categorized as having the lowest level of conservation treatment for nitrogen management receives manure as fertilizer. In contrast, less than six percent of the acreage categorized as having a high level of nitrogen management receives manure. The USDA 2010 Report further states that the most critical conservation concern in the region is nitrogen loss through subsurface pathways, most of which eventually discharges to surface waters, and that about 65 percent of cropped acres require additional nutrient management to address excessive levels of nitrogen loss to groundwater. Ensuring dairy manure is land-applied appropriately is critical for protecting local and regional surface and ground water quality.

#### (b) Biosolids Use Regulation

Over 50 percent of the biosolids land-applied in Virginia are imported from out-of-state facilities.<sup>30</sup> By 2017, Virginia should eliminate the use of phosphorus index (P index) for fields receiving biosolids. Instead, biosolids should be required to be land-applied according to soil test nutrient recommendations. Also, require the same setback for riparian areas as required for poultry litter (100 feet with no permanent vegetative buffer, and 35 feet with a permanent vegetative buffer).<sup>31</sup> In addition, eliminate land-application of biosolids in December, January, and February and eliminate application to saturated, frozen, or snow-covered ground. The 2017 deadline will allow for municipal wastewater treatment facilities to install waste-to-energy facilities that convert excess biosolids to renewable energy. Changes to the biosolids regulations could be made administratively, without legislation.

#### (c) CBPA

Require all agricultural land uses in counties covered by the CBPA (not just agricultural land in the resource protection and/or management areas) to comply with a minimum buffer requirement of 35 feet, and minimum conservation standards including development and implementation of soil conservation plans and Virginia certified NMPs. Currently, agricultural land in the resource protection area in production prior to passage of the CBPA does not have to comply with the buffer requirements. Also, the buffer requirements need to be updated with research conducted over the last two decades that indicates that a 35-foot buffer is the minimum buffer width necessary for sediment and nutrient reduction to surface waters.<sup>32</sup> Last, we

---

<sup>30</sup> Commonwealth of Virginia. 2005. Review of land application of biosolids in Virginia. Report of the Joint Legislative Audit and Review Commission. House Document No. 89.

<sup>31</sup> 9 VAC 25-630-10 et seq.

<sup>32</sup> Richard Lowrance et al., *Evaluation of Coastal Plain Conservation Buffers using the Riparian Ecosystem Management Model*, J. Am. Water Resources Association 1445, 1445 (2001). See USDA NRCS, *Conservation Practice Standard: Riparian Forest Buffer 2* (Jan. 2006).

recommend that DCR support local governments in efforts to enforce provisions of the CBPA by dedicating staff to conduct random inspections using the same inspection protocols currently in place for the Virginia Agricultural Cost-Share Program. Violations should be reported to local governments for enforcement. Chesapeake Bay Act compliance measures should ensure that local governments are enforcing agricultural provisions of the CBPA.

(d) Virginia Nutrient Management Standards and Criteria

The USDA 2010 Report previously mentioned illustrates the importance of development and implementation of NMPs on cropland, and the lack of widespread implementation of plan recommendations (NMPs are either not developed or improperly implemented on more than 81 percent of cropland in the Bay watershed). This represents a two-fold loss for both water quality and farm profits. Proper implementation of NMP regulations avoids over-application of fertilizer, and prevents nutrient pollution.

As such, Virginia should place a strong emphasis on NMP development and implementation, requiring implementation on farms with more than 100 acres that receive nutrients by March 1, 2015. With respect to cropland, this would cover almost 90 percent of Virginia's harvested cropland and affect just over 5,000 Virginia farmers, many of whom already are implementing certified nutrient management and soil erosion control plans to various degrees. Further, DCR and NRCS should work together to ensure that Virginia certified nutrient management planners understand that NMPs are living documents that will likely require revision on an annual, if not semi-annual, basis. Regular communication with their clients is essential to ensure that the plan is up-to-date and to address problems with implementation. This can be accomplished via training and scheduling cost-share payment reimbursement to planners that is tied to regular plan updating and consultation with farmers through the lifespan of the plan.

Additionally, CBF is also concerned that the phosphorus site index (P Index) is not sufficiently protective of water quality. While the P Index is a valuable tool in identifying regions at high risk for phosphorus loss, soil scientists that developed the P Index state in no uncertain terms that the P Index is not an adequate tool to address regional imbalances in manure.<sup>33</sup> They strongly recommend that all producers be encouraged to apply manure at rates designed to meet plant uptake requirements and avoid over-application of phosphorus. They note that continued reliance on the P Index in areas where manure is produced in excess of crop needs is not sustainable in the long term, and will lead to an eventual build up of soil phosphorus to levels where no further phosphorus can be applied.

In light of that, CBF recommends that the Virginia Nutrient Management Standards and Criteria be modified to phase out the use of the P Index to justify over-application of phosphorus (beyond soil test recommendations) by 2017 for biosolids application and poultry litter, and by

---

<sup>33</sup> Phosphorus indices to predict risk for phosphorus loss. Available online at: [www.seral7.ext.vt.edu/Documents/P\\_Index\\_for\\_%20Risk\\_Assessment.pdf](http://www.seral7.ext.vt.edu/Documents/P_Index_for_%20Risk_Assessment.pdf).

2025 for other livestock.<sup>34</sup> In the interim, plans developed for soils with high phosphorus should include a long-term strategy and proposed implementation timeline for reducing soil phosphorus to levels that protect water quality and allow for application of phosphorus at rates recommended by soil test results.

Soil scientists also recommend that state P Indices be correlated with local water quality requirements.<sup>35</sup> As such, the Virginia P Index should be recalibrated to take into account pollution reduction goals for P proposed in the Virginia Bay TMDL. Specifically, the minimum criteria for edge-of-field P runoff and leachate should be that nutrient concentrations in receiving waters not cause water quality impairment (algae, aquatic habitat, etc.). The tool should also identify those fields or situations where even with the best conservation, no additional P should be applied.

CBF is also concerned that threshold pre-screening procedures used in Virginia allow for application of phosphorus to soils already at risk for increased phosphorus loss to surface waters (for example, fields close to streams), without the benefit of running the P index to identify critical source areas where more intensive management is appropriate. Research indicates that risk for phosphorus loss in surface runoff and leaching begins to increase in soils that exceed a 20 to 30 percent degree of phosphorus saturation (DPS) threshold.<sup>36</sup> As such, CBF recommends that the P index should be used to determine phosphorus application rates for all soils that test greater than 20 percent DPS and for fields located within 150 feet of surface waters.

CBF also recommends that the Virginia Nutrient Management Standards and Criteria regulations be modified to include requirements to prevent erosion from exceeding the soil erosion tolerance level ("T"). The USDA 2010 Report emphasizes that "nutrient management practices need to be paired with erosion control practices to obtain net reductions in soluble nutrients." As such, NRCS is currently considering the addition to the NRCS Nutrient Management Code of general requirements that soil erosion rates not exceed the tolerance factor (Code 590) standard.<sup>37</sup> This approach makes sense because soil fertility, nutrient availability, and phosphorus transport are all directly related to soil erosion.

In addition, because nutrient transport to surface waters is strongly correlated with the distance from the field to surface water, we recommend that the Virginia Nutrient Management Standards and Criteria also include a requirement for riparian buffers of at least 35-feet in width that complies with NRCS standards for grass buffers or forested buffers (NRCS 391 Riparian Forest Buffer or NRCS Code 390 Riparian Herbaceous Cover Standard). Research has established that a 35-foot buffer is the minimum width necessary to provide surface runoff

---

<sup>34</sup> 4 VAC 5-15.

<sup>35</sup> SERA-17. November 2010. Revision of the 590 Nutrient Management Standards – SERA-17 Recommendations. Available online by November 12, 2010 at: [http://www.sera17.ext.vt.edu/SERA\\_17\\_Publications.htm](http://www.sera17.ext.vt.edu/SERA_17_Publications.htm).

<sup>36</sup> Butler, J.S. and F. J. Coale. 2005. Phosphorus leaching in manure-amended Atlantic Coastal Plain soils. J. Environ. Qual. 34:370–381.

<sup>37</sup> USDA Natural Resources Conservation Services, 2010. Official First Review Draft, September 22, 2010, Conservation Practice Standard Nutrient Management Code 590.

remediation.<sup>38</sup> Forested buffers are particularly valuable and increase in-stream nitrogen processing by two-to-eight fold increase over contiguous riparian areas with grass buffers.<sup>39</sup> A mandatory buffer will effectively act as a setback for all forms of applied fertilizer. This would level the playing field for poultry litter, which has a mandatory 35 feet application setback from a stream if a permanent, vegetated buffer is established, or 100 feet otherwise. As such, it is appropriate to require fertilizer application setbacks as well as the establishment and maintenance of buffer areas to provide remediation of surface water runoff from fields receiving nutrients as an integral part of nutrient management planning in Virginia.

*(3) Require livestock stream exclusion by 2017.*

The proposed adoption rate of livestock stream exclusion on 95 percent of Virginia's pastures proposed in the draft WIP is unrealistic without a regulatory driver. State code should be revised to require the following:

- Require livestock stream exclusion by 2017 when local TMDL implementation plans for bacteria, general benthic, sediment, nitrogen, or phosphorus list livestock as a causative factor in the impairment, and where livestock stream exclusion is required to achieve water quality goals; and
- Require livestock stream exclusion for farms with herd sizes greater than 20 cows between 2017 and 2025. This would apply to approximately 42 percent of cattle farms and result in exclusion of 94 percent of Virginia's cattle from streams.

Note that DCR distributed a draft piece of legislation to SAG members in August 2010 that included livestock exclusion requirements, but it was not included as part of the draft WIP.

*(4) Create a safe harbor provision for Virginia farms by 2011.*

The draft WIP proposes that a "resource management plan," as defined by NRCS, will be deemed to be in compliance with the draft WIP and any associated law or regulation. First, it should be noted that this language does not suggest that compliance with the draft WIP is associated with implementation of the plan. The current language suggests that merely having a plan constitutes compliance. Further, it is also important to note that NRCS does not have a definition for the term "resource management plan."

While NRCS does have a number of definitions for various types of conservation plans, CBF has a concern that these lack the performance standards necessary for ensuring nutrient and sediment reductions. For example, the most basic conservation plan is simply a record of the farmer's decision and is required for all NRCS-funded practices. Any farmer who has received cost-share funding from NRCS has a conservation plan on file. The basic NRCS conservation

---

<sup>38</sup> B.W. Sweeny, et. al., 2004. Riparian deforestation, stream narrowing, and loss of ecosystem services. In: Proceedings of the National Academy of Scientists, September 28, 2004.

<sup>39</sup> B.W. Sweeny, et. al., 2004. Riparian deforestation, stream narrowing, and loss of ecosystem services. In: Proceedings of the National Academy of Scientists, September 28, 2004.

plan could be written for one field out of twenty fields associated with the farm, and include a description of one BMP that the farmer has agreed to implement, out of a number of BMPs that might be recommended and necessary to protect water quality. Clearly, obtaining a conservation plan does not provide any assurance that appropriate BMPs are being implemented.

NRCS does offer more far-reaching conservation planning services, however, widespread implementation of more comprehensive conservation plans (such as a resource management system) can take several days (or longer) to develop for a whole farm, and would require a significant investment in staff.

While comprehensive conservation planning should be encouraged, given the logistics of developing plans for over 40,000 farms in Virginia, the more simplified approach outlined below will accomplish the dual goals of providing performance-based farm-specific planning tools and Bay TMDL compliance.

Agricultural producers in compliance with all the applicable planning and scheduled implementation requirements of the following could be deemed to be in compliance with the WIP:

- Applicable federal and state permits and laws;
- Implementation of a soil conservation plan that meets NRCS criteria that reduces soil erosion to at or below the soil loss tolerance level (T), as defined by NRCS, for each field on the farm;
- For crop, hay, or pasture land receiving nutrients, implementation of a NMP written by a certified Virginia nutrient management planner. When manure or poultry litter nutrients are used, this must include manure storage necessary to ensure appropriate timing of manure application as specified in the NMP;
- Establishment of a winter cover crop, either for production (Virginia Agricultural Cost-share practice SL-8H) or soil erosion protection and nutrient removal (Virginia Agricultural Cost-share practice SL-8 and SL-8B);
- Creating a permanent 35-foot vegetated (either grass or forest) riparian buffer that meets NRCS practice standards (NRCS 391 Riparian Forest Buffer or NRCS Code 390 Riparian Herbaceous Cover Standard);
- Livestock stream exclusion;
- Properly protected barnyards that employ BMPs necessary to prevent manure and runoff from confinement areas from entering streams and waterways.

In order for this safe harbor provision to be applicable, the state will need to develop some means of verifying that these BMPs are being properly implemented and maintained.

Note that it is important to clarify that implementing these provisions will secure producers with a safe harbor for Bay TMDL compliance only—there may also be local stream



TMDLs that need to be addressed and as such, local governments may need to pass additional ordinances as may be necessary to protect local water quality.

*(5) Expand enforcement of existing and proposed programs by 2011.*

The Commonwealth should immediately expand enforcement of the existing agricultural programs described below in order to realize new pollution reductions.

(a) Animal Feeding Operations (AFOs) that discharge manure to surface waters are in violation of state law.<sup>40</sup> DEQ has existing authority to address facilities violating this rule. Virginia should evaluate whether existing staff levels are sufficient to accomplish this goal. Staffing may need to be increased by two or three persons in high-density production areas of the Commonwealth, primarily the Shenandoah Valley. Increased enforcement of Virginia regulations will mean it will be less likely for EPA to intervene and expand coverage of the EPA Concentrated Animal Feeding Operations (CAFO) Final rule<sup>41</sup> to smaller facilities. It is in the dairy industry's best interest to ensure Virginia takes control of correcting these problem facilities, as EPA has no flexibility with respect to CAFO rule enforcement, whereas Virginia has the option to allow for a case-by-case determination of the implementation schedule for corrective actions.

(b) Enforcement of proposed NMP recommendations, livestock exclusion, and CBPA agricultural requirements should be conducted by DCR staff using the random spot-check approach currently used to verify Virginia Agricultural Cost-Share Program BMP implementation. This would assist local governments in enforcing agricultural provisions of the Bay Act and help to ensure enforcement is uniform across the region.

(c) Agricultural producers participating in environmental stewardship programs that include third party verification (using protocols approved by DCR) should be given the lowest priority for inspections.

(d) The Virginia Agricultural Stewardship Act (ASA) is currently under-utilized and under-staffed. With only one staff person, and investigation of complaints only when they are reported by the public, the ASA fails to achieve its potential. Specific limitations of the ASA include:

- The ASA is complaint driven and thus relies on members of the community to "turn in" their neighbor. Given the risk to an individual's standing in the community and fear of repercussions, understandably, people are reluctant to file a complaint, even where there are egregious water quality problems;

---

<sup>40</sup> 9 VAC 25-260-30.

<sup>41</sup> U.S. Environmental Protection Agency. November 20, 2008. 40 CFR Parts 9, 122, and 412. Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines for Concentrated Animal Feeding Operations in Response to the Waterkeeper Decision

- The ASA is not designed to handle issues such as over-application of manure because it is difficult to “prove” water pollution, even when it is clear that manure is being handled inappropriately; and
- Timelines for complying with a corrective action plan are too lenient—up to 18 months, with a possible six month (or longer) extension from the Commissioner.

The program is not sufficiently staffed or effectively utilized as a compliance measure, or as a deterrent. As such, CBF recommends the following changes to the ASA:

- Rather than requiring a report on a violation and a subsequent investigation, an ASA violation should be triggered automatically for failure to implement practices outlined in local TMDL implementation plans, failure to install riparian buffers of 35 feet or more, and for failure to implement NMP or livestock stream exclusion requirements;
- Staff levels should be increased;
- Timeline for implementation of the corrective action plan should be shortened, especially for egregious water quality problems and repeat offenders;
- A fine structure should be established in Code, rather than being left to the Commissioner’s discretion;
- A specific timeline for Virginia Department of Agriculture and Consumer Services (VDACS) investigations should be established to ensure that violations are addressed in a timely manner; and
- Owners of land rented to farmers should be held equally responsible for a violation and for ensuring the problem is addressed.

Note that farmers complying with the previously recommended Safe Harbor provisions would be exempt from additional requirements to meet Bay TMDL goals, but may have to implement practices necessary to protect local water quality. As such, they would not be exempt from ASA violations.

*(6) Develop alternatives to land application of manures.*

Hand in hand with expansion of existing regulatory programs and phasing out the over-application of manure phosphorus, we recommend that the Virginia WIP propose a strategy for increasing alternatives to land application, including clean technologies that convert manure to saleable fertilizer and/or renewable energy. With respect to manure-to-energy technologies, Virginia should pursue technologies that avoid simply transferring excess nutrients from water to air pollution. The fate of nitrogen associated with manure-to-energy technologies is particularly of interest, as nitrous oxide emissions often associated with converting manure or poultry litter to energy via thermochemical conversion technologies can also cause water pollution, as well as ozone formation. It is also important to consider that these approaches may require a public investment—particularly for dairy manure, which is not economically feasible to transport over long distances.

*(7) Reduce ammonia emissions from animal feeding operations.*

Virginia's WIP should also focus on reducing ammonia emissions from animal feeding operations. Recent research indicates that the total ammonia emission rate for broilers including losses in-house, during storage, and following land application, is 0.07 pounds of TN per bird.<sup>42</sup> Virginia produces approximately 241 million broilers each year (not including turkeys and laying hens), which could potentially release almost 17 million pounds of TN to the atmosphere. Once in the atmosphere, ammonia is subject to both wet and dry deposition and has been demonstrated to be a significant source of nitrogen pollution in coastal rivers and estuaries.<sup>43</sup> Existing BMPs that reduce the loss of ammonia from poultry production should be fully utilized—particularly the use of poultry litter amendments at rates recommended for maximum ammonia gas reduction. Additionally, increasing implementation of ammonia-control technologies and BMPs, including improved house design, feed management, and other approaches that reduce emissions and/or capture ammonia, should also be considered.

*(8) Offsets for new growth.*

For existing CAFOs, Virginia should assign a WLA for loads from (i) CAFO production areas, assuming standard BMPs are in place, and (ii) land-application areas, assuming a NMP is in place. Purchase of nutrient offsets should be required for any discharge from a CAFO in violation of a permit (i.e. runoff from a field where manure was applied inappropriately according to the NMP, where manure was applied without an NMP, or an unpermitted point source discharge from a production area).

For new and expanding CAFOs, complete offset for all loads from production areas and land application should be required. In other words, these operations do not get a “free” allocation for any discharge from properly managed production areas and NMP lands. However, because the aggregate loading from animal agriculture is not expected to grow significantly in the future, we support the concept of reserving “allocations” from any existing animal agricultural operations/acreage that are taken out of production for future use as offsets by existing CAFOs that expand, or new CAFOs that come on-line.

With respect to new or expanded loadings from other agricultural operations that may grow, such as turf farms or nurseries, DCR should develop an assessment by 2017 to determine whether growth is occurring in non-permitted agricultural operations and whether an offset requirement needs to be established. Alternatives to purchasing offsets could be the installation of BMPs necessary to reduce nutrient and sediment runoff to baseline pre-development levels.

---

<sup>42</sup> P. Moore Jr., et al. 2010. Ammonia emissions factors from broiler litter in barns, storage, and after land application. *Journal of Environmental Quality*, published online August 9, 2010.

<sup>43</sup> A. Aneja, et al. 2008. Ammonia emissions from agriculture-U.S. status and needs. *Journal of Environmental Quality*, 37:515-520.

### *Conclusion*

Full implementation of these recommendations will provide the level of reasonable assurance needed to achieve pollution reductions from this source sector in the revised pollution allocations based on a Level 3 level of effort included in Section IV. These recommendations recognize the agricultural community's desire for clear expectations and commitment to widespread adoption of basic BMPs in a manner that avoids a one-size-fits-all approach.

Absent adoption of these recommendations or other similar approaches that will provide assurance that agricultural sector goals will be met, CBF recommends lowering the pollution reduction expectations for the agricultural sector, and increasing pollution reduction expectations for the WWTP source sector.

## **III. Stormwater**

### *Background*

Virginia has developed numerous programs to address discharges of runoff from urban and suburban lands and industry (collectively "urban runoff") to surface waters. The Virginia Erosion and Sediment Control Law, Erosion and Sediment Control Regulations, and Erosion and Sediment Control Certification Regulations arose beginning in the 1970s to control the discharge of pollution from active land-disturbing activities.<sup>44,45,46</sup> The pollutants of concern in urban runoff include sediment, nutrients, and other pollutants, as well as, the peak flow rate, volume, and timing of runoff. The Virginia Stormwater Management Act, Virginia Stormwater Management Permit Regulations (VSMP), and the CBPA and Regulations came about in the 1990s to control the discharge of these same pollutants from active and finished private development (or "post-construction" activities), municipal separate storm sewer systems (MS4s), and industrial activities.<sup>47,48,49,50</sup> Virginia issues VPDES individual or general permits to these categories of discharges. Urban runoff from private active and post-construction activities are covered under the five-year Construction General Permit, discharges from MS4s are covered by individual permits (larger "Phase 1" communities") or a five-year general permit (smaller "Phase 2" communities), and industrial releases are covered by a five-year general permit.<sup>51,52,53</sup> Lastly, the Code provides some authority under local planning, subdivision, and zoning programs to take actions that impact urban runoff.

---

<sup>44</sup> Va. Code §10.1-560.

<sup>45</sup> 4 VAC 50-30.

<sup>46</sup> 4 VAC 50-50.

<sup>47</sup> Va. Code §10.1-603.1.

<sup>48</sup> 4 VAC 50-60.

<sup>49</sup> Va. Code §10.1-2199 et. seq.

<sup>50</sup> 9 VAC 10-20.

<sup>51</sup> 4 VAC 50-60-1100 et. seq. (July 1, 2009).

<sup>52</sup> 4 VAC 50-60-1200 et seq. (July 8, 2008).

<sup>53</sup> 9 VAC 25-151 - General VPDES Permit for Discharges of Storm Water Associated with Industrial Activity. July 1, 2009.

Despite the program capacity already in place to address this pollution source sector, urban runoff has become a principle reason that thousands of river miles across the state and the entire Bay remain polluted. Statewide, 1,570 stream miles are impaired because of urban runoff.<sup>54</sup> Many urban and suburban streams are falling apart, subject to hazardous flooding, clogged by sediment and trash, and/or are largely devoid of native aquatic life. These streams help make up the 100,000 streams that feed the Bay. Urban runoff is responsible for ten percent of the TN, 17 percent of the phosphorus, and 15 percent of the sediment that pollutes the Bay and its rivers.<sup>55,56</sup> Reports from EPA and the U.S. Geological Survey have concluded that efforts to clean the Bay are losing ground specifically because progress reducing pollution from other source sectors is being offset by increased urban runoff pollution.<sup>57, 58</sup> While the existing program capacity, proactive dischargers, and new technologies helped reduce pollution from individual sites since between 1985 and 2005, the sheer pace at which farms and forests were converted to development has caused the “aggregate” pollutant loading over this same period to increase by 16 percent.<sup>59</sup> It is this total pollutant loading that fuels impairment of the Bay; thus the Bay is facing significant problems moving forward if this pollution source sector is not arrested.<sup>60</sup>

#### *Draft WIP*

The draft WIP proposes extremely aggressive allocations for this pollution source sector. As noted earlier, the Commonwealth calculated reductions for each pollution source sector from “E3” treatment and two levels of greatly enhanced treatment that are less stringent than E3.<sup>61</sup> For urban runoff, Level 2 called for retrofit of 20-25 percent of impervious surfaces and 20 percent of pervious surfaces, while Level 3 included retrofit of 40-50 percent of impervious and 20 percent of pervious.<sup>62</sup> E3 would involve retrofit of 100 percent of existing urban lands. The urban runoff

---

<sup>54</sup> L. Lutz. 2009. Get the Dirt Out effort works to get construction sites to clean up their acts—Program trains citizens to recognize and report violations of sediment control regulations. Bay Journal. January 2009.

<sup>55</sup> Commonwealth of Virginia. 2010. Spreadsheet provided to the Virginia WIP SAG titled, *VA Basin Loads—Nitrogen and Phosphorus [Million Pounds/Year]*.

<sup>56</sup> EPA Chesapeake Bay Program, Watershed Model progress run spreadsheet, July 30, 2010.

<sup>57</sup> U.S. EPA Office of Inspector General. 2007. Evaluation Report: Development Growth Outpacing Progress in Watershed Efforts to Restore the Chesapeake Bay. Report No. 2007-P-00031, September 10, 2007.

<sup>58</sup> U.S. Geological Survey. 2007. *Synthesis of U.S. Geological Survey Science for the Chesapeake Bay Ecosystem and Implications for Environmental Management—Summary of Findings and Management Implications*. Circular 1316.

<sup>59</sup> U.S. EPA Office of Inspector General. 2007. Evaluation Report: Development Growth Outpacing Progress in Watershed Efforts to Restore the Chesapeake Bay. Report No. 2007-P-00031, September 10, 2007.

<sup>60</sup> Virginia Secretary of Natural Resources. January 2005. Commonwealth of Virginia, *Chesapeake Bay Nutrient and Sediment Reduction Tributary Strategy*.

<sup>61</sup> Commonwealth of Virginia. 2010. *Virginia’s Watershed Implementation Plan: Background, Approach and Summary of Proposed Actions Discussion Draft, 8/24/2010*. This document was distributed at the last SAG meeting before release of the draft WIP. It proposed levels of treatment and corresponding actions for the main source sectors. The levels of treatment corresponded to a scoping spreadsheet distributed to the SAG that described for TN and TP current reduction progress, allocations consistent with an “everything, everywhere, by everyone” or E3 level of treatment, and allocations consistent with two lesser treatment levels, termed Level 2 and Level 3.

<sup>62</sup> Commonwealth of Virginia. 2010. Presentation provided to Virginia WIP SAG titled, *Virginia’s Chesapeake Bay River Basins—2009 Progress, L2, L3, and Draft Allocations Loads*. July 16, 2010.



allocations for the James, Rappahannock, and York River basins are set at “E3.” Specifically, for TN, the James and Rappahannock were set based on E3, and for TP, the James and York were set based on E3. The urban allocations for TN in the Potomac and York and for TP in the Rappahannock are also aggressive, set to be more stringent than Level 3 (“Level 3+”). The remaining three basin/pollutant combinations are set at Level 3.

As discussed at the outset of this section, it is clear that Virginia’s existing urban runoff programs have so far been incapable of arresting stormwater’s growing impact on the Bay. With that said, these programs are in no way sufficient to achieve the E3 level of treatment posited in the draft WIP. Frankly, we find it unlikely that *any* combination of mandates, funding, and incentives could provide reasonable assurance for achieving E3 levels of implementation from this sector. The sheer cost, legal barriers, and logistics involved make E3 completely unrealistic at the basin-level.

We also feel strongly that existing programs cannot provide reasonable assurance that a level of increased BMP implementation can be achieved that will deliver reductions in pollution from this sector. Outdated provisions in the state erosion and sediment control, CBPA, and urban runoff programs, and the lack of numeric pollution reduction requirements and deadlines to meet water quality standards in existing VPDES permits issued to Phase 1 and 2 MS4 communities, private development industry supports our position. Further, there are no public funding programs in place to provide the financial assistance needed to retrofit existing urbanized lands. A growing number of proactive communities that have adopted local stormwater fees are ahead of the game, but they do not begin to collect monies to cover the cost to meet existing or proposed retrofit goals.<sup>63</sup> The draft WIP does not commit to any new program capacity to address these deficiencies, instead indicating the Commonwealth will “consider” or “investigate” a list of new authorities, regulations, and funding mechanisms to meet the proposed allocations. While the draft WIP did describe in general some potentially viable strategies to fill gaps, none were fleshed out with details and analysis that demonstrates a strong obligation to pursue them. Any thought that additional reductions from this sector can be realized through the NCE, without first establishing mandates that urban runoff dischargers improve their performance by a deadline, is unrealistic. Further discussion of an expanded NCE is included later in this section.

Some new programs may be on the horizon to address future growth from this sector. A proposed revision to the VSMP regulations for discharges of post-construction stormwater from private development created over a nearly a four-year period were finalized at the close of the Kaine Administration in 2009. In short, these regulations would have required new development to achieve the average treated predevelopment pollution loading from the farm and forest lands it replaced (equated to a TP criterion of 0.28 pounds/acre/year). The regulations were subsequently suspended in January 2010 and are being reevaluated by the Commonwealth to address concerns that they were technically flawed and too costly to developers.<sup>64</sup> However, the draft WIP includes this very same requirement as the “Tier 1 load balancing approach” stating that new development

---

<sup>63</sup> Some communities with stormwater utilities in place include Alexandria, Prince William County, Richmond, Newport News, Hampton, Suffolk, Portsmouth, Chesapeake, Norfolk, and Virginia Beach.

<sup>64</sup> [www.townhall.state.va.us/L/ViewStage.cfm?stageid=5397](http://www.townhall.state.va.us/L/ViewStage.cfm?stageid=5397).

will be held to a post-development load that “produces a no net increase from the average forest, cropland, pasture, and hay loads after treatment with the suite of agriculture and forest BMPs as previously identified in this WIP.”<sup>65</sup> In fact, based on Virginia’s own chosen source sector allocations, the draft WIP anticipates a TP criterion of 0.26 pounds/acre/year, which is more stringent than the criterion in the suspended regulations.<sup>66</sup> While CBF strongly supported this approach through the development of the proposed post-construction regulations, we are unsure whether to take this provision seriously based on the McDonnell Administration’s support of the suspension of the regulations. These regulations must *actually* be promulgated for the Commonwealth to claim this program as a means to provide reasonable assurance that the requirements of the TMDL will be met.

The Commonwealth’s Tier 2 load-balancing approach in the draft WIP “will allow for an accounting of existing programs and practices on the ground that are currently either inadequately tracked or not tracked at all.”<sup>67</sup> Assuming that this means that Virginia will improve enforcement and tracking of pollution reductions obtained from existing programs, CBF strongly supports this action.

Lastly, CBF supports the Commonwealth’s plan to require federal facilities to manage existing and new stormwater discharges consistent with Presidential Executive Order 13508, the Energy Independence and Security Act of 2007, and the Clean Water Act.<sup>68,69</sup>

### *Recommendations*

In the forthcoming pages CBF offers **seven** specific revisions to the draft WIP that will help provide a high level of reasonable assurance that the revised pollution allocations for the urban runoff sector in Section IV can be met. Note that these allocations are set based on a Level 2 effort included in the August 24, 2010 SAG discussion draft.

#### *(1) Establish a new state program to fund the retrofit of existing developed lands by 2011.*

The Commonwealth and every state, locality, homeowners association (HOA), and commercial development in the nation, is facing the significant challenge of how to pay for capital projects and ongoing maintenance programs to address the pollution discharged by the existing urban and suburban landscape. Further complicating this task is that many lands were developed prior to any requirements to address the quantity and quality of stormwater. Also, the HOAs that own many urban runoff practices on private lands are loosely organized and have very little funding options, short of association fees that usually only cover routine maintenance, if that.

---

<sup>65</sup> See draft WIP, note 1, page 74.

<sup>66</sup> Calculated using the equation draft WIP agricultural TP allocation + draft WIP forest allocation/total agricultural acres in Virginia Bay watershed + total forest acres in Virginia Bay watershed: 2,146,000 lbs + 1,090,000 lbs / 2,817,000 acres + 13,928,000 acres = 0.26 TP lbs/acre.

<sup>67</sup> See draft WIP, page 77.

<sup>68</sup> See Executive Order 13508.

<sup>69</sup> Pub.L. 110-140.

Potential actions, generally called “urban retrofits,” could include the upgrade and repair of existing flood control infrastructure, upgrade of stormwater BMPs, disconnection or replacement of impervious surfaces, installation of practices for water reuse, and restoration and protection of urban streams. The retrofit concept is not defined in the draft WIP and is viewed differently across stormwater practitioners and regulators. For the Virginia WIP, we suggest defining the “retrofit of an acre of urban land” as the installation and maintenance of actions that reduce nutrient pollution to the maximum extent practicable from that acre of land.

These types of efforts, particularly the “core” public works needs, are already ongoing, planned, or needed in most urbanized areas of the state in order to comply with TMDLs on local waterways, meet MS4 or Combined Sewer Overflow (CSO) Long-Term Control (LTCP) requirements, prevent hazardous flooding and property damage after heavy rains, protect drinking water supplies, and to generally improve the livability of their communities. Bay TMDL or not, these actions will, and must, take place eventually. In many cases, full implementation of work that is already mandated or locally essential for local rivers, creeks, and streams should be more than enough to protect the Bay downstream. Where Bay requirements necessitate actions beyond those that are locally driven, the NCE and other incentives can be used to reduce the costs of this work. However, we reject the premise that most local and Bay-related urban runoff infrastructure improvement needs can be avoided by an expansion of the NCE.

There is no question that there will be significant costs to address this problem. History has proven that the cost of public infrastructure projects only increases with time. For example, communities that chose to pursue full or partial separation of old CSO systems 20 years ago surely saved hundreds of millions of dollars, compared to cities that are pursuing CSO work today. The tributary strategy listed the costs to meet requirements for the urban sector at \$7.5 billion.<sup>70</sup> Note that this also includes costs for the installation of stormwater BMPs for new development activities that will be absorbed by developers and builders, and skews high in our opinion because lower cost non-structural practices that reduce stormwater volume were not fully considered in the estimate. Regardless, it could cost billions to retrofit and maintain urban lands in a manner that protects local waters and the Bay.

Thus, the Commonwealth must immediately pursue (i) an appropriate mechanism to deliver funding and incentives to the localities, homeowners, and private lands that pursue retrofits on existing developed lands, and (ii) a dependable source of funding to cover capital and maintenance costs for these retrofits.

We suggest a revision to the Code that creates an urban retrofit funding program to distribute monies. This program should only fund a relatively short list of proven practices that “capture” runoff on-site through infiltration, evapotranspiration, and reuse, thereby reducing pollution and augmenting and protecting existing drinking water sources. Eligible “green infrastructure” practices could include urban tree cover, rainwater harvesting and reuse systems, disconnection of impervious surfaces, pervious pavement installation (green alleys, sidewalks),

---

<sup>70</sup> See tributary strategies, page 69.

rain gardens, swales, bioretention, green roofs, and targeted pond and filtration retrofits that support improved infiltration. New installation of stormwater ponds for storage, paved channels, and other infrastructure specifically designed for flood control that have limited ability to reduce nutrients or protect drinking water should not be included. The program should include both a cost-share component for localities and HOAs (similar to that in place now for WWTP upgrades and agricultural BMPs) and a tax credit component for existing commercial and industrial landowners.

Such a program should use a sliding-scale to determine cost-share amounts, with a higher percentage provided for those that pursue projects the soonest, those that are closest to waterways, and/or those that would provide the greatest pollution reductions. Eligibility requirements should also apply, including provision of a specified match (obtained via stormwater fee or other sources) by localities or HOAs and maximum utilization of “non-structural” practices (indicated in existing MS4 and industrial stormwater permits) by commercial and industrial lands.

Such an innovative fund will be of little use if it not adequately funded. Therefore, the Commonwealth must make a real, long-term commitment to address this problem now, before the costs ascend further. A consistent source of funding via an appropriate tax or fee is best to assist with long-term planning by potential fund users, while budget-to-budget allocations to the General Fund, the approach used for WWTP and agricultural funding, is a workable, but less desirable option. Additionally, CBF believes strongly that the federal government must play a significant role in funding this work, perhaps mimicking the approach used to fund thousands of WWTP upgrades nationwide after passage of the CWA. Further, CBF has spent more than a year actively supporting the Chesapeake Clean Water Act, which would provide \$2.5 billion for these types of stormwater retrofits Bay watershed-wide.<sup>71</sup> Whether through this proposed law, targeted allocations to states from EPA via the State Revolving Loan Fund (SRLF), or another funding instrument, we are committed to working with the U.S. Congress and EPA to dramatically increase funding for stormwater retrofits.

Three law changes and new permits would be needed to support this program. The new urban retrofit fit would need to be created within the WQIF, Virginia Clean Water Revolving Loan Program, or as a new section of code. To facilitate this new program, and ensure access to stormwater funding that may be available through the federal SRLF in the future, the code would need to be changed to allow funding of stormwater projects under the Virginia Clean Water Revolving Loan Program (VCWRLF). As currently written the VCWRLF is limited to financing only WWTP, agricultural, Brownfields, and land conservation projects.<sup>72</sup> Also, the existing NCE provisions in the code would need to be amended to properly integrate urban runoff to help meet Bay-related goals in a manner that protects local water quality. And lastly, VDPEs regulations and/or permits that cover existing developed lands would need to be amended to include a specific retrofit mandate, as discussed further in the next recommendation.

---

<sup>71</sup> S. 1816: Chesapeake Clean Water and Ecosystem Restoration Act (Cardin).

<sup>72</sup> [www.vra.state.va.us/cleanwater.shtml](http://www.vra.state.va.us/cleanwater.shtml).

Funding the control of stormwater pollution from existing developed lands will not be cheap. But the Commonwealth can begin to heal its urban streams, ensure existing urban lands do their part to clean the Bay, and save billions of dollars in the long-term by facing up to the problem now and establishing a strong and sustainable program for completing this important work.

*(2) Establish aggressive, yet feasible, retrofit mandates in MS4 permits by 2012.*

The Commonwealth should revise and reissue by 2012 the currently administratively continued individual MS4 permits for the 11 Phase 1 communities and revise the existing general MS4 permit for Phase 2 communities to include binding retrofit requirements. The permits should mandate a Level 2 level of treatment of MS4 acreage by 2025. This is the same level of treatment proposed by the Commonwealth in the August 24, 2010 discussion draft. This would require retrofit of 25 percent of high intensity impervious land (1.6 percent per year), 20 percent of low intensity land (1.3 percent per year), 10 percent of high intensity pervious land (0.67 percent per year), and 10 percent (0.67 percent per year) of low intensity pervious land. Note that we suspect that if implemented, urban turf fertilization restrictions recommended below will assist with achievement of the pervious lands goals.

Employing the NCE to assist compliance can be appropriate, provided trading is used to meet a binding limit included in the permit and trading does not result in local water quality impairments. If limits are set at such a stringent level that the limits can only realistically be achieved through acquisition of credits, there must be a demonstration by the discharger and/or the Commonwealth in developing the program that adequate credits are available to meet the need. Requiring confirmation up front that credits are available and under an exchange contract during the permit renewal process, similar to the permitting approach for wetlands mitigation, is a potential means to provide surety that anticipated reductions will be achieved. In regions where a comprehensive watershed plan is in place, equivalent reductions within the same watershed that meet other mandates and goals of the Bay TMDL, should be allowed. Lastly, the total nutrient reductions to meet these mandates over the 15-year WIP period should be used to set WLAs for each MS4 community, and these WLAs should be included in the Phase 1 individual permit or in a registration list (or equivalent) for the Phase 2 general permit.

*(3) Restrict the sale and application of fertilizer to turfgrass statewide beginning in 2012.*

Turf coverage in the Bay watershed ranges from 2.1 to 3.8 million acres, or 5.3 percent to 9.5 percent of total Bay watershed area, and roughly 75 percent of this turf cover is potentially devoted to home lawns.<sup>73</sup> This same study estimated that turf acreage in Virginia, which stood at 1,100,000 acres in 2001, has grown faster than population or impervious cover in the last three decades, with an annual growth rate of 8.6 percent.<sup>74</sup> As of 2004, 62 percent of turf acreage in

---

<sup>73</sup> Schueler, T. 2010. CSN Technical Bulletin No. 8—The Clipping Point: Turf Cover Estimates for the Chesapeake Bay Watershed and Management Implications. Chesapeake Stormwater Network.

<sup>74</sup> Id.



Virginia was home lawns.<sup>75</sup> Turf grass is now the largest crop grown in the Bay watershed, and even represents the single largest irrigated crop in the U.S.<sup>76,77</sup> Between July 1, 2008 and June 30, 2009, fertilizer for non-agricultural use represented 41 percent by weight of that sold in the Commonwealth.<sup>78</sup> The remaining 59 percent is applied to agricultural lands. We estimate that non-agricultural fertilizers represent approximately nine percent of the TN and ten percent of the TP applied as fertilizer in Virginia.<sup>79</sup> A significant amount of fertilizer is applied by homeowners who do not have expertise in nutrient management planning or turf management. All told, the misapplication of these fertilizer nutrients to urban lawns can result in significant pollution to waterways in urban areas.

Thankfully, there are some common-sense, cost-effective approaches to improving management of turf fertilizer that minimizes pollution, assists compliance with local TMDLs, MS4 permits, and ordinances, and helps maintain healthy grass cover.

(a) Contract application of TN and TP to turfgrass.

About 20 percent of turf lands in Virginia (about 200,000 acres) receive fertilizer from private contract applicators.<sup>80</sup> Currently about 10 percent of these acres are enrolled in a voluntary DCR program that promotes NMP practices.<sup>81</sup> VDACS is currently in the process of revising its regulations and recommending Code revisions for the contract application of fertilizer to turfgrass.<sup>82</sup> Below we describe our suggestions for revising these regulations. A more detailed explanation of these recommendations was included in written comments submitted to VDACS in October 2010.<sup>83</sup>

Training. CBF supports VDACS proposal in the revised regulations to require contract applicators to receive training and certification to ensure that nutrients are applied in accordance with provisions for turfgrass in the Virginia Nutrient Management Standards and Criteria.

---

<sup>75</sup> Id.

<sup>76</sup> Id.

<sup>77</sup> Milessi, C.S. et al. 2005. Mapping and modeling the biogeochemical cycling of turf grasses in the United States. *Environmental Management*. 36(3): 426-438.

<sup>78</sup> Commonwealth of Virginia. 2009. Total Fertilizer Summary Uniform Fertilizer Tonnage Report from July, 2008 to June, 2009.

<sup>79</sup> Assume 20 percent nitrogen and 25 percent phosphorus content for farm and non-farm multi-nutrient fertilizer (Based on *The Fertilizer Encyclopedia*, by V. Gowariker et al., Copyright 2009 by John Wiley & Sons, Inc.), and average nitrogen and phosphorus content in lawn fertilizer (20 percent, and 5 percent, respectively from average of both turf starter and turf maintenance fertilizer blends). Also assumes that organic fertilizer sold has same nitrogen and phosphorus concentration as dry poultry litter, per Virginia Nutrient Management Standards and Criteria.

<sup>80</sup> Estimate from DCR staff.

<sup>81</sup> Id.

<sup>82</sup> Chapter 36 of Title 3.2 of the Code of Virginia.

<sup>83</sup> Letter to Erin Williams, Policy & Planning Coordinator, VDACS from Kristen Hughes Evans, CBF, October 13, 2010.

Reporting. As currently proposed by VDACS, accounting of nutrient management acres will rely on the voluntary program managed by DCR. We strongly recommend mandatory annual reporting to the state that includes TN and TP applied, total acreage receiving these nutrients (by county or city), and total acreage receiving these nutrients in accordance with nutrient management criteria requirements. This type of basic, aggregate data is already collected by applicators and its submission to VDACS once a year will not be overly burdensome or elicit business privacy concerns. Voluntary reporting is inappropriate for a regulatory program, particularly one that is assisting with implementation of the Bay TMDL, MS4 permits, and other local water quality directives. Collection of this data will also allow Virginia and localities to get proper credit under the Bay TMDL and other TMDLs for urban runoff. A proper accounting of these actions has the potential to reduce the need for more expensive urban retrofits and address the concerns raised in the draft WIP and amongst stakeholders that on-the-ground BMPs are not being adequately counted. Simply put, Virginia and EPA cannot obtain an accurate count of actions if they are not efficiently reported.

Enforcement. Contract applicators that fail to comply with nutrient management requirements should face significant financial disincentives, including a substantial fine as well as loss of license and individual applicator certification. Fines for failure to comply should at least double the estimated cost of complying (i.e. the cost of training courses for staff).

Labeling. Labeling of lawn fertilizer sold in Virginia should have clear language advising consumers on how to use the product appropriately to achieve desired results and avoid pollution of surface waters. The currently proposed language is insufficient. Specifically, CBF recommends the inclusion of language compatible with Florida's labeling requirements for fertilizer sold at retail. The Florida law states that the following language shall appear conspicuously on bags of fertilizer sold at retail:

*"Do not apply near water, storm drains or drainage ditches. Do not apply if heavy rain is expected. Apply this product only to your lawn/garden, and sweep any product that lands on the driveway, sidewalk, or street, back onto your lawn/garden."*

Given that we do expect frozen soils in Virginia and know that some homeowners do use fertilizer as a de-icer, we would recommend that the second sentence be modified to read:

*"Do not apply to frozen or saturated ground, or if heavy rain is expected Do not use this product as a de-icer."*

A final version of the VDACS regulations consistent with these ideas, and appropriate Code changes, are needed to accomplish these recommendations.

(b) Sale and application of TP fertilizer for lawn maintenance.

A recent report by Virginia Tech researchers evaluated several management approaches to reducing TN and TP runoff from fertilized urban acreage.<sup>84</sup> The reports' key conclusions were that the implementation of a wide range of fertilizer management practices and policies could significantly reduce runoff of TN and TP, and that by carefully restricting application rates, TN loss in urban runoff from well-managed turfgrass will be minimal. The authors recommended a range of approaches that are estimated to reduce annual TN and TP pollution to surface waters in Virginia by **454,646** and **123,655** pounds, respectively.

Based on the results of this and other studies, the existence of similar programs in at least ten other states already, CBF supports a new program to restrict the sale and application of lawn fertilizer that includes the following components that are consistent with the Virginia Tech study:<sup>85</sup>

- Establish point-of-sale restriction on lawn fertilizer that contains TP for lawn maintenance. Most well-established home lawns and landscapes will not be soil phosphorus limited, but exceptions would be needed for “new ground” seedings, active construction sites, or critical renovation areas in home lawns where soil test validates an actual phosphorus deficiency. Requirements for signage and point-of-sale education should also be included.
- Establish a point-of-sale requirement for lawn fertilizer that it must contain at least 25 percent slow-release TN. Guidance should be provided regarding the benefits of one-time and annual applications. Many manufacturers already combine quick and slow release sources of TN to take advantage of both strengths. The quick release source provides quick green-up but is at a sufficiently low rate to prevent salt injury or reduce the potential for leaching. The slow release source is available to provide a greening response for a longer duration.
- Prohibit contract applicators from applying TP to established lawns without a soil test and require compliance with strict annual and one-time TN application in accordance with Virginia Nutrient Management Standards and Regulations for turfgrass management.
- Bar application of fertilizer on sidewalks, driveways, or other paved surfaces.
- Establish appropriate seasonal application restrictions to prevent application to frozen ground.
- Create appropriate exemptions for organic sources of TN in fertilizer.

Implementation of this recommendation would require passage of a new statewide law. An appropriate phase-in period through 2012 would be appropriate for the TP provisions, and

---

<sup>84</sup> Virginia Tech. 2010. *Effect of Fertilizer Management Practices on Urban Runoff Water Quality*.

<sup>85</sup> State-wide or local programs that restrict the use of lawn fertilizer are in place in Minnesota, Michigan, Maryland, Illinois, Florida, Wisconsin, Maine, New York, and New Jersey.

perhaps a longer period for the slow-release TN requirement. Take note that DCR distributed a draft piece of legislation to SAG members in August 2010 that included very similar requirements, but it was not included part of the draft WIP.

*(4) Make several improvements to the Virginia Erosion and Sediment Control Program.*

The Commonwealth should pursue two common-sense improvements to Virginia's Erosion and Sediment Control programs that have the potential to deliver reductions in nutrient and sediment pollution.

First, Virginia should require that sites be at least temporarily stabilized within three days of site disturbance, rather than seven days as currently allowed by the Erosion and Sediment Control regulations. Shortening the time sites may remain destabilized will reduce the chance that sudden rain events will wash sediment, nutrient, and high runoff volumes from the sites. Virginia should also expeditiously revise the regulations and associated guidance to ensure they are consistent with the federal effluent limitations guidelines (ELGs) for the construction and development industry when they are finalized.<sup>86</sup>

Next, nutrient management on active construction sites should be consistent with DCR's "Technical Bulletin No. 4—Nutrient Management for Development Sites."<sup>87</sup> This bulletin advocates application of 50 percent of the TN that is presently recommended in the 1992 *Virginia Erosion & Sediment Control Handbook* for permanent vegetative stabilization on construction sites. Based on more recent nutrient management science, the recommended amount of TN is excessive. This could provide significant TN reductions through 2025.

In order to achieve these pollution reductions, revision and reissuance of the Construction General Permit and revision of state regulations will be necessary. We suggest that this action take place as soon as the currently suspended ELGs are finalized by EPA.

*(5) Initiate an intensive education campaign on citizen education to reduce stormwater pollution.*

The Commonwealth should promptly begin a statewide media campaign to educate citizens about steps they can take to reduce urban runoff. The campaign should use television and other new media that maximizes reach into the community. The focus should be on simple actions that reduce urban runoff, protect drinking water, and save people money. Such a campaign has the potential to provide immediate reductions in pollution from changes in citizen behavior, and future reductions indirectly by building citizen support for water quality programs. **Table 4** suggests ten actions to consider for such a campaign.

---

<sup>86</sup> 74 FR 62996, December 1, 2009.

<sup>87</sup> DCR. 2003. *Technical Bulletin No. 4 - Nutrient Management for Development Sites*.

**Table 4—Ten Things Citizens Can Do to Prevent Stormwater Pollution and Save Money**

1. Limit use of fertilizer.	6. Never dump anything down the drain.
2. Use native plants.	7. Perform environmentally-friendly car care.
3. Pick up trash.	8. Pick up after your pet.
4. Keep water away from pavement.	9. Drive less.
5. Compost yard waste.	10. Become active in your community.

*(6) Require no net increase in post development pollution loads from new development by 2012.*

Virginia should promulgate new regulations for post-construction stormwater that at least provide a no net increase in TN and TP loadings from the average predevelopment conditions to ensure that all nutrient loads from new development are fully offset. The draft WIP indicates a willingness to finalize these regulations. Moving toward 2025, the state should require that new development achieve a no net increase from the forested condition, either on-site or through acquisition of offsets.

*(7) Establish regulations and incentives that promote redevelopment and sound land use.*

The Commonwealth should take the following steps to reduce pollution from existing and future developments. Virginia should promulgate the new regulations for post-construction stormwater that require a 20 percent reduction in TN and TP from redeveloped lands. The draft WIP indicates a willingness to finalize these regulations.

Studies indicate that high density development provides less stormwater pollution per capita than low density greenfield development.<sup>88,89,90</sup> We suggest that Virginia create incentives for redevelopment of existing urban corridors and projects in planned growth areas that include specific sound land use elements, such as supporting higher density, compact development, transit-oriented design, multiple uses, and/or increased open space, buffers, or tree canopy areas that are permanently protected. Incentives could include tax reductions, density bonuses, parking waivers, fee reductions, and rapid project approval. Some local governments already provide a mix of incentives for certain actions. Incentives should only apply to projects that are in approved urban development areas (UDAs), are compliant with the CBPA (if applicable), and are consistent with the local comprehensive plans.

<sup>88</sup> EPA. 2004. *Protecting Water Resources with Smart Growth*. EPA 231-R-04-002, May 2004.

<sup>89</sup> EPA. 2005. *Using Smart Growth Techniques as Stormwater Best Management Practices*. EPA 231-B-05-002, December 2005.

<sup>90</sup> EPA. 2006. *Protecting Water Resources with Higher-Density Development*. EPA 231-R-06, January 2006.



### *Conclusions*

CBF concludes that full implementation of these recommendations will provide the level of reasonable assurance needed to achieve pollution reductions from this source sector in the revised pollution allocations based on Level 2 included in Section IV.

## **IV. Onsite Wastewater Systems**

### *Background*

Conventional on-site sewage systems and alternative onsite septic systems (AOSS) are installed in Virginia. AOSS systems overcome drainfield area and other site limitations that preclude the use of conventional systems. Approximately 536,200 systems are located in the Virginia Bay watershed, with 11,000 new systems added each year (10 percent are AOSS). The Code, the Sewage Handling and Disposal Regulations, and Emergency Regulations for Alternative Onsite Systems govern these systems.<sup>91,92,93</sup> EPA and the Commonwealth assume these systems retain all TP onsite. The Code provides authority for the Virginia Department of Health (VDH) to set TN limits on AOSS, but not for conventional systems. The existing AOSS regulations require large systems (greater than 1,000 GPD) to meet a five mg/TN limit. It has been VDH's policy for years to require compliance with the drinking water standard of ten mg/L nitrate-N in groundwater for all systems using mass drainfields (greater than 1,200 GPD). Note that dilution, not necessarily treatment, may be used to meet these TN limits. VDH does not administer funding programs for conventional or AOSS systems, although the code authorizes a betterment loan program to repair and or upgrade existing systems. The CWRLF, WQIF, and other programs sometimes provide grant funds for upgrades.

Even though programs are in place to address TN from new large AOSS, the sheer number of new conventional systems—many using 100-year old technology—will result in the total TN pollution from this source sector to continue to increase with growth. While onsite systems in Virginia only provide about four percent of TN load to the Bay, clusters of outdated or failing systems can pollute groundwater used for drinking water and nearby surface waters, such as poorly flushing creeks, embayments, and coves. The draft WIP indicated that, “VDH is beginning to see an increase in the number of applications for larger onsite systems in the Chesapeake Bay Watershed, but it is difficult to determine the trend.”<sup>94</sup> It is reasonable to conclude that the advent of new AOSS technologies that overcome conditions that ruled out conventional systems is driving this trend.

---

<sup>91</sup> Va. Code §32.1, Chapter 6.

<sup>92</sup> 12 VAC 5-610.

<sup>93</sup> 12 VAC 5-613.

<sup>94</sup> See draft WIP, page 87.

### *Draft WIP*

The onsite system source sector portion of the draft WIP provides a well-written and direct overview of the challenges faced by this sector. Like stormwater, the draft WIP proposes a TN allocation based on an E3 level of treatment for this sector in the James River basin. The remaining TN allocations are at Level 2, which is the same level of treatment in the August 24, 2010 discussion draft. TP allocations are not provided to this sector.

The draft WIP acknowledges that existing onsite programs will not be able to reduce TN discharges to the Bay. Similar to our stormwater comments, there is absolutely no way that an E3 level of treatment can be achieved in the James River basin. Further, while the allocations were set based on Level 2 treatment and the draft WIP *describes* the new program capacity prescribed in the scooping scenario as necessary to meet Level 2 (installation of TN removal, septic pump outs), like the other NPS sectors, there was no *commitment* to pursue necessary new program capacity needed to support the effort. However, the draft WIP does indicate that new pending regulations for AOSS will propose the inclusion of TN limits for small AOSS systems (less than 1,000, mostly single family homes), elimination of the dilution option for compliance by large systems, and more stringent design standards for placement in sensitive areas. Lastly, there is no commitment to pursue new funding to upgrade existing systems, nor is there a specific pledge to institute offset requirements to address pollution from new systems. Taken in total, the existing programs and draft WIP do not provide reasonable assurance that the proposed allocations can be met.

### *Recommendations*

We offer the following **six** specific revisions to the draft WIP that will help provide a high level of reasonable assurance that the revised pollution allocations for the onsite sector in Section IV can be met. Note that these revised allocations are set based on a Level 2 level of effort included in the August 24, 2010 discussion draft.

- (1) Require existing septic systems within sensitive areas to install best available technology for TN or offset equivalent load by 2025.*

The Commonwealth should require all existing conventional or alternative onsite systems in sensitive areas to install best available technology (BAT) for TN or offset an equivalent load for the design life of the system. Single family home systems that hook up to an existing WWTP or a community onsite system that achieves BAT would also meet this mandate. “Sensitive areas” should be defined as onsite systems whose effluent dispersal components are within 100 feet of the ordinary high water mark of surface waters, open channel MS4s, sink holes, or public or private sources, including wells, springs, and reservoirs. This 100-foot boundary is consistent with new EPA guidance for onsite systems on federal lands that calls for a 100-foot setback for system components from these waters.<sup>95</sup> Even a properly operating onsite system can discharge

---

<sup>95</sup> EPA. 2010. Guidance for Federal Land Management in the Chesapeake Bay Watershed—Chapter 6. Decentralized Wastewater Treatment Systems.

TN that far exceeds secondary levels of treatment. Thus, systems operating in sensitive areas can result in a locally-significant direct discharges. Also, dilution should no longer be used for compliance with TN limits. Improved performance in these areas will help protect drinking water sources, shellfish waters, and help meet local bacteria TMDLs and other mandates, as well as help reduce pollution to the Bay downstream. This recommendation is consistent with the new proposed regulations for AOSS; however, this approach extends the more stringent requirements to all systems in sensitive areas.

Specific Code changes would be required to allow VDH to mandate TN treatment for conventional systems and allow system owners to access an appropriate offset program. Changes to the Sewage Handling and Disposal Regulations would also be needed. Lastly new grant, loan, and incentive programs are warranted to achieve this recommendation. A 15-year implementation schedule based on system size and risk is recommended to phase in this requirement.

*(2) Require installation of BAT for all new and replacement septic systems within 1,000 feet of sensitive areas by 2012.*

Virginia should require that all new and replacement onsite systems within 1,000 feet of sensitive areas achieve at least a BAT for TN or offset an equivalent load for the design life of the system. This is also consistent with recent EPA guidance and new law in Maryland.<sup>96,97</sup> The BMP proposed by VDH in the draft WIP that employs a denitrification system with a shallow placed, pressure dosed dispersal system is one way to accomplish this level of treatment. As noted in the previous recommendation, specific Code and regulation changes will be needed to allow TN treatment standards for conventional systems and access to offsets by developers.

*(3) Improve enforcement of the existing CBPA septic pump out provisions immediately, and expand those provisions Virginia Bay watershed-wide by 2025.*

The Commonwealth must ensure that the septic system provisions of the CBPA are fully enforced to maximize capture of nutrients. The CBPA regulations require that septic systems in the Resource Protection Areas be pumped out at least every five years, or alternatively, install sediment trapping systems approved by VDH. Further, a five-year pump-out requirement should be required of all systems in the Virginia Bay watershed by 2025. A new law and regulations would be required to expand the pump-out requirement.

*(4) Prohibit new onsite systems in sensitive areas by 2012.*

The state should prohibit the placement of any onsite system components in sensitive areas as defined in the first recommendation. This action will prevent TN inputs, and even TP

---

<sup>96</sup> DEQ. 2010. *Virginia Draft 305(b)/303(d) Water Quality Integrated Report to Congress and the EPA Administrator for the Period January 1, 2003 to December 31, 2008.*

<sup>97</sup> State of Maryland. SB554: Chesapeake Bay Nitrogen Reduction Act of 2009.

inputs, as phosphorus could be released if the systems discharge to hydric soils or soils that are already saturated with phosphorus. This would require a Code and regulation changes.

*(5) Establish a financial assistance program for system improvements by 2012.*

The Commonwealth should create a tax credit program to assist system owners in complying with the first recommendation for this source sector. Appropriation of funding to support the existing betterment loan program should also be considered to assist with costs borne by the system owner. A Code change would be necessary to support this new program.

*(6) Require offsets from all new systems through an in-lieu fee approach.*

All nutrient pollution from new onsite systems should be offset. Adequate funds should be collected to offset the load for the life of the system. To ease compliance with this standard, we suggest establishing an in-lieu fee program that allows landowners who are newly required to upgrade their systems the option to pay into a fund. Funds should be available for use by localities for nutrient reduction projects. Such a fund is discussed further in the NCE section below.

*Conclusions*

CBF concludes that full implementation of these recommendations will provide the level of reasonable assurance needed to achieve pollution reductions from the onsite sector in the revised pollution allocations based on Level 2 included in **Section IV**.

## **V. Expanded Nutrient Credit Exchange**

*Background*

Market-based pollution trading programs have been established or are under development across the nation. Pollution trading in the United States began with the Acid Rain Program established in 1990 to reduce the atmospheric emission of sulfur dioxide and nitrogen oxides primarily from coal-fired power plants.<sup>98</sup> This program has been hailed as a success by EPA, industry, and others. Owing to the success in the air arena, as many as 70 water quality trading programs are underway or being explored across the country.<sup>99,100</sup> Most of these programs have used “point source-to-point source” credit trading approaches or were specifically limited in participants or geographic scale. Newer programs operating in Connecticut to protect the Long Island Sound and in Pennsylvania and Virginia for the Bay are the farthest along in setting up programs that allow “point source to NPS” trades, support offset of pollution from future growth,

---

<sup>98</sup> Title IV of the Clean Water Act.

<sup>99</sup> [www.epa.gov/owow/watershed/trading/tradingprograminfo.xls](http://www.epa.gov/owow/watershed/trading/tradingprograminfo.xls).

<sup>100</sup> S. Greenhalgh and M. Selman. 2005. *Nutrient Trading – A Water Quality Solution?* World Resources Institute. Presentation at OECD Workshop on Agriculture and Water: Sustainability, Markets, and Policies. November 14-18, 2005.



and/or are focused on large coastal watersheds. A study by the Water Resource Institute in 2010 concluded that a Bay-wide nutrient trading program could help reduce nutrient pollution in the Bay in the most cost-effective and timely manner.<sup>101</sup>

Virginia established the NCE in 2005 and created a permitting mechanism for the program in 2006.<sup>102,103</sup> This program allows point-to-point and NPS credit exchange for compliance, offsets to address growth, and “bubbling” or sharing of WLAs by WWTPs that are part of the same sewerage authority. In 2010, the code was amended to require offset of any nutrient pollution from new small WWTPs that discharge more than 1,000 GPD.<sup>104</sup> Also in 2009, a provision was added to allow compliance with stormwater requirements at §10.1-603.4 through the use of offsets.<sup>105</sup> The ability to use offsets was expanded to allow compliance with MS4 permits and TMDLs in 2010.<sup>106</sup>

As noted in the WWTP sector section, the existing NCE has supported 46 point-to-point source nutrient contracts, which are projected to help accelerate pollution reductions at lesser cost. To our knowledge, no point source-to-NPS trades have taken place so far. Several private nutrient banks hold NPS offsets for sale, but the current excess capacity held by point sources and the lack of appropriate regulatory drivers for potential buyers has precluded a market for these offsets to date.

CBF supported the legislation that created the NCE programs described above. Our focus during development of the enabling legislation was to ensure that the program operated at an appropriate scale and with sufficient rules to meet the following broad goals: (i) ensure delivery of actual reduction in pollution loads to the Bay and its rivers, (ii) help offset pollution from future growth, (iii) protect local water quality and meet local mandates, and (iv) include realistic expectations and deadlines for the ability of the approach to solve water quality programs. Our conclusion after five years of operation is that the NCE is working as designed for point-to-point source trades, with some minor legislative changes it can facilitate offset of new growth, and lastly, with firm regulatory drivers, may eventually sustain a viable NPS trading component.

### *Draft WIP*

The draft WIP proposes a significant expansion of the NCE. This program expansion is only vaguely described, short of indicating that it will reduce reliance on implementation of sector-specific BMPs, allow agriculture and onsite systems to purchase credits to achieve compliance, and that allocations—very aggressive allocations—for urban runoff and onsite systems can be attained through the expanded NCE. The draft WIP does not include any analysis of credit supply and demand, projected offset needs, the cost of credits, or any other data

---

<sup>101</sup> Jones, C., et al. 2010. *How Nutrient Trading Could Help Restore the Chesapeake Bay*. WRI Working Paper. World Resources Institute.

<sup>102</sup> Va. Code § 62.1-44.19.

<sup>103</sup> 9 VAC 25-820. General Permit for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia. January 1, 2007.

<sup>104</sup> Va. Code §§ [62.1-44.19:14](#) and [62.1-44.19:15](#) (HB1135, 2010).

<sup>105</sup> Va. Code § [10.1-603.8:1](#) (by HB2168, 2009).

<sup>106</sup> Va. Code § [10.1-603.8:1](#).K (by SB627, 2010).

to prove that this approach can be sufficient to meet the pollution allocations. Further, the document fails to even mention the types of new legislative authority or regulatory changes that are needed to launch an expanded program. In fact, the draft WIP is explicit that, “The specific details of an expanded nutrient credit exchange will be developed through the legislative and regulatory processes of the Commonwealth.”<sup>107</sup>

While the NCE was recognized as an important tool in the draft worksheets, scoping scenarios, and draft plans presented to the SAG, the wholesale use of the NCE proposed in the draft WIP appears to have been added late in the process. As presented, this approach raises significant concerns. Three problems undermine the potential success of an expanded program:

1. The lack of any regulatory mandate or other driver to compel the presumptive users of this expanded approach—the urban runoff or onsite sectors—to purchase credits. There would be no reason for an MS4 or homeowner to purchase credits unless they are required to improve their performance by a set amount by a set date.
2. The Commonwealth has a mixed record maintaining a firm cap in program participants. Maintaining pollution caps is absolutely critical to a successful market-based trading program. If participants believe it is more efficient to invest in efforts to seek an increased cap, rather than investing in credits, the program will not work. Requests for additional WLAs were before the General Assembly in the past, yet did not become law. To date at least two administrative requests for additional nutrient WLAs were rejected by the State Water Control Board.<sup>108</sup> However, in April 2009, the Board approved a request for additional pollution allocations by Merck.<sup>109</sup> And unfortunately, in September 2010, the Board overturned its previous denial (in April 2009) by approving a settlement which increased the WLAs of the Frederick-Winchester Service Authority’s Opequon WWTP.<sup>110</sup> We fear some will argue that these decisions establish a precedent that caps are not firm.
3. There is no evidence presented in the draft WIP to support the premise that WWTPs would be willing to permanently give up via sale the amount of nutrient allocations that appear to be necessary to support an expanded effort. Excess wastewater capacity is “gold” to localities, and it seems unlikely that significant credit exchanges, even between WWTPs and MS4s that serve the same community, would be acceptable to local elected officials.

The draft WIP states in regard to filter feeders, such as oysters, that “Virginia is committed to increasing the population of these natural filters and believes credit for filter feeder restoration and the associated nutrient removal should be recognized in implementing the James River TMDL.” The concept of integrating oyster restoration into nutrient trading programs has

---

<sup>107</sup> See draft WIP, at 6.

<sup>108</sup> These denials included requests by the Craigsville and Boston Water and Sewer WWTPs.

<sup>109</sup> See Final Regulation, Agency Background Document, Virginia Regulatory Town Hall, May 7, 2009.

<sup>110</sup> See *id.*; see also Order, dated October 19, 2010, Frederick-Winchester Service Authority v. Commonwealth, et al., C.A. No. 9-4.7 (Winchester Cir. Ct., VA).



been evaluated by Virginia Commonwealth University and Virginia Tech and there has been growing support for this concept amongst stakeholders.<sup>111</sup>

CBF is a leader in promoting native oyster restoration and oyster aquaculture, and is actively involved in the protection of menhaden and other filter feeders. However, at this time, for the following reasons, we oppose allowing oysters or other filter feeders placed instream to be used to generate nutrient offsets to assist permitted sources with attainment of water quality standards:

- Right now CBF can only support offset approaches that prevent or reduce pollution from entering surface waters, not those that will treat it after it has been released. Once in surface waters, TN and TP can cause ecological effects (algal blooms, dead zones, harm aquatic life) and it will be very difficult, if not impossible, to ensure that those effects will be adequately mitigated by oysters or other instream treatment options, particularly if they are not in the same geographic location.
- Nitrogen removal efficiency of oysters is very site specific. Consequently, we cannot be certain that their removal efficiencies will be the same at different locations and under different conditions. For example, if oysters are placed in polluted water, or exposed to algal blooms or other stressors, and they cease feeding or do not feed as efficiently, they may not remove as much pollution as anticipated.

We will, however, strongly support oysters as an adjunct to, not a replacement for, the reduction of pollution from land-based sources. Additionally, use of oysters and other filter feeders “off-stream” in constructed water bodies to provide additional treatment of WWTP discharges or runoff before it reaches waterways may be a potential option in the future.

Finally, the draft WIP recognizes the ability of the existing NCE to offset new loads from the largest WWTPs and introduces the concept of establishing a perpetual funding source for offsets that could have great promise as a way to truly offset loads from developed lands. While not committing to pursue new program capacity, the draft WIP identifies some workable solutions to fill gaps in the existing NCE program by requiring small WWTPs and onsite systems to purchase offsets.

### *Recommendations*

- (1) Establish firm mandates for regulated parties expected to participate in the NCE program by 2012.*

The Commonwealth should expeditiously establish more stringent nutrient limits and deadlines for compliance for the dischargers that are envisioned to participate in the expanded NCE. MS4s, onsite systems, and potentially, the largest non-significant dischargers would be subject to new mandates. Further, the state should work with the State Water Control Board to ensure that WLAs in place for significant WWTP plants are not increased to accommodate future

---

<sup>111</sup> <http://oyster.agecon.vt.edu/>.

plant capacity needs. As discussed earlier in this section, without a firm regulatory driver, there is nothing to compel source sectors to participate in any market-based trading programs.

*(2) Create an in-lieu fee offset program for small dischargers by 2012.*

To comply with retrofit or offset requirements placed on smaller dischargers, such as those from small WWTPs (less than 1,000 GPD) or onsite systems used for single family homes, Virginia should create an appropriate program to accept in-lieu fee payments to address delivered nutrient pollution for the working life of the system. The concept of establishing a fund that would set, collect, and manage these in-lieu payments such that needed “perpetual” reductions are provided is a good idea that should be explored further. Such funds could be provided to localities to pay for less intensive actions whose cost can reasonably be expected to be covered by the funds expected to be collected. Septic pump outs, buffers and tree plantings, urban BMP maintenance, and urban nutrient management may be options.

*(3) Establish different offset ratios for different types of development.*

Maryland’s draft WIP introduced the use of different ratios for different types of development. New development of “greenfield” areas will be required to provide more offsets than development in existing or planned growth corridors. Such an approach can help encourage the types of high density development in growth areas that studies show are better for water quality. Virginia should consider building at least a modest version of this approach into the expanded NCE, perhaps requiring additional offsets for new development of forests and fewer offsets for new development in UDAs or projects that achieve specific land-use principles. Care should be taken to ensure that the “net” offsets across all new development still compensate for new pollution loads.

## **VI. Two-Year Milestones**

### *Background*

EPA provided detailed guidance to the Bay jurisdictions about the content of the WIP and two-year milestones. “EPA expects the Watershed Implementation Plans and two-year milestones will contain **greater source sector and geographic load reduction** specificity, **more rigorous assurance** that load reductions will be achieved, and **more detailed and transparent reporting** to the public than past Bay restoration efforts [*emphasis added*].”<sup>112</sup> Further, EPA’s April 2, 2010 follow-up guidance provides a series of questions to aid in WIP development. One question reads, “Does the Bay jurisdiction indicate how nutrient and sediment loads, by major basin, are expected to decrease over time so that EPA can assess future two-year milestones?”<sup>113</sup> The clear intent here is to avoid the mistake made in the past of waiting until deadlines are upon us before assessing progress (determining in 2007 that the 2010 goal would not be met for

<sup>112</sup> Letter from William Early, EPA, Acting Regional Administrator to L. Preston Bryant, Virginia Secretary of Natural Resources. November 4, 2009.

<sup>113</sup> EPA. 2010. A Guide for EPAs Evaluation of Phase I Watershed Implementation Plans. April 2, 2010.

example). EPA is looking for step-wise plans and targets that will assist with adaptive management and tracking progress by the jurisdictions and EPA during the 15-year life of the WIP.

#### *Draft WIP*

Unfortunately, the draft WIP does not comply with these requirements. It does not project the loads by basin and source sector or actions that will be pursued during each two-year period through 2025. The draft WIP indicates that, "Assessing compliance with two-year milestones will be based upon total loadings, not by compliance with individual source sector allocations."<sup>114</sup> However, the draft WIP contradicts this stated approach by also stating that, "Another component of this adaptive management approach is a requirement to develop two year milestones that provide **specificity regarding pollutant control measures to be implemented** within each two year period and to support maximum accountability [*emphasis added*]."<sup>115</sup> Based on the failure to provide any breakdown of two-year plans in the draft WIP, our presumption is that total loadings will be used to assess progress every two years.

#### *Recommendations*

The Commonwealth should describe in the final WIP the approximate pollution reduction milestones by source sector for each two-year period and list the anticipated actions it will take to help meet each milestone goal. Greater specificity should be provided for near-term efforts, with more general types of actions appropriate for longer-term efforts. This information is essential to meet EPA's and stakeholders requests for more accurate and transparent tracking of BMPs and pollution reduction progress.

---

<sup>114</sup> See draft WIP, page 47.

<sup>115</sup> Letter from William Early, EPA, Acting Regional Administrator to L. Preston Bryant, Virginia Secretary of Natural Resources. November 4, 2009.

**EXHIBIT 2:**

**THE VALUE OF THE CHESAPEAKE BAY AND CLEAN WATER ACROSS VIRGINIA**



Provided below is a comprehensive presentation of the benefits or avoided costs that demonstrate the value of the Chesapeake Bay, its rivers, and clean waters across Virginia.

*(1) The Chesapeake Bay provides significant economic benefits to the region.*

Congress has recognized that the Chesapeake Bay is a “national treasure and resource of worldwide significance.”<sup>1</sup> A 1989 study from the state of Maryland that looked at fishing, tourism, property, and shipping activities estimated the value of the Bay to Maryland and Virginia to be \$678 billion.<sup>2</sup> Considering inflation, an expert panel in 2004 placed the value at over \$1 trillion, with an annual economic benefit of \$33 to \$60 billion.<sup>3,4,5</sup> A 2010 report said that waters that make up Delaware’s portion of the Bay watershed—only one percent of the watershed—support 47,000 jobs and \$1 billion in annual economic activity.<sup>6</sup>

*(2) The Bay supports an important commercial and recreational fishing economy.*

The 2008 *Fisheries Economics of the U.S.* report by the National Oceanic and Atmospheric Administration (NOAA) indicates that commercial seafood industry in Maryland and Virginia contributed \$2 billion in sales, \$1 billion in income, and more than 41,000 jobs to the local economy.<sup>7</sup> This same report showed economic benefits of saltwater recreational fishing that are equally as impressive, contributing \$1.6 billion in sales, which in turn contributed to more than \$800 million of additional economic activity and roughly 13,000 jobs.<sup>8</sup> An earlier study by the Virginia Institute of Marine Science (VIMS) estimated that in 2004, recreational and commercial fishing contributed \$1.23 billion in sales, \$717 million in income, and more than 13,000 jobs in Virginia, with two-thirds of the impact from recreation.<sup>9</sup> Other studies focused just on sport-fishing in Virginia found that salt waters alone generate \$1 billion and 5,000 jobs, and saltwater and freshwaters combined create over \$2 billion and 15,000 jobs.<sup>10,11</sup> The Bay region generated \$908 million in commercial fishing landings from 2000 to 2004, with 97 percent coming from the

---

<sup>1</sup> Chesapeake Bay Restoration Act of 2000, Nov. 7, 2000, P.L. 106-457, Title II, § 202, 114 Stat. 1967.

<sup>2</sup> Maryland Department of Economic and Employment Development. 1989. *Economic Importance of the Chesapeake Bay*.

<sup>3</sup> Chesapeake Bay Blue Ribbon Finance Panel. 2004. *Saving a National Treasure: Financing the Clean up of the Chesapeake Bay*. A Report to the Chesapeake Executive Council from the Chesapeake Bay Watershed Blue Ribbon Finance Panel.

<sup>4</sup> EPA. 2009. Draft Chesapeake Bay Compliance and Enforcement Strategy.

<sup>5</sup> Maryland Department of Natural Resources. [www.dnr.state.md.us/dnrnews/infocus/bay\\_faq.html](http://www.dnr.state.md.us/dnrnews/infocus/bay_faq.html). Visited July 22, 2010.

<sup>6</sup> Delaware’s Draft Phase I Chesapeake Bay Watershed Implementation Plan. September 1, 2010. Appendix F.

<sup>7</sup> NOAA 2008. 2008 Fisheries Economics of the U.S.

<sup>8</sup> NOAA 2008. 2008 Fisheries Economics of the U.S.

<sup>9</sup> Kirkley, et. al. 2005. *Economic Contributions of Virginia’s Commercial Seafood and Recreational Fishing Industries: A User’s Manual for Assessing Economic Impacts*. Virginia Institute of Marine Science (VIMS), VIMS Marine Resource Report No. 2005-9, December 2005.

<sup>10</sup> Southwick Associates. 2006. *The Relative Economics Contribution of U.S. Recreation and Commercial Fisheries*.

<sup>11</sup> America Sportfishing Association. 2008. *Sportfishing in America: An Economic Engine and Conservation Powerhouse*.

Bay.<sup>12</sup> Over one-third of the nation's blue crab harvest comes from the Bay, generating a dockside value of approximately \$70 million in 2008, with an average value of \$55 million between 1999 and 2008.<sup>13</sup> Rockfish generated \$97 million in 2003 and oysters \$13 million in 2008 for Maryland and Virginia.<sup>14,15,16</sup> Shellfish aquaculture is growing in Virginia, with clams generating \$70 million per year and oysters \$7 million per year.<sup>17</sup> And lastly, keep in mind that the recreational fishery also provides a significant financial offset for Bay residents; the cost of catching crabs is far less than having to buy them.

On the loss side, between 1994 and 2004 the value of Virginia's seafood harvest decreased by 30 percent.<sup>18</sup> VIMS has shown that when the broader impact on restaurants, crab processors, wholesalers, grocers, and watermen is added up, the decline of crabs in the Bay meant a cumulative loss to Maryland and Virginia of about \$640 million between 1998 and 2006.<sup>19</sup> A CBF report stated that between 1998 and 2006 crabbing-related jobs in Maryland and Virginia declined 40 percent, from 11,246 to 6,760.<sup>20</sup> Other reports have estimated the decline in the number of watermen.<sup>21,22</sup> A study by the University of Maryland demonstrated that decreases in dissolved oxygen can reduce crab harvests and revenue to watermen.<sup>23</sup> Threats from sewage and bacteria forced Maryland and Virginia to close or restrict oyster harvesting in 223,864 acres of the Bay and its tributaries in 2008, about eight percent of the total shellfish beds.<sup>24</sup> The decline of the Bay oyster over the last 30 years has meant a loss of more than \$4 billion for Maryland and Virginia.<sup>25</sup> A fish kill in the Shenandoah River watershed in 2005 resulted in \$700,000 in economic losses.<sup>26</sup> Lastly, the Gulf oil spill in 2010 has cost the Virginia oyster industry \$11.6 million.<sup>27</sup>

---

<sup>12</sup> Lellis-Dibble, K. A. et al. 2008. *Estuarine Fish and Shellfish Species in U.S. Commercial and Recreational Fisheries: Economic Value as an Incentive to Protect and Restore Estuarine Habitat*. U.S. Dep. Commerce, NOAA Tech. Memo. NMFSF/SPO-90.

<sup>13</sup> NOAA 2008. 2008 Fisheries Economics of the U.S.

<sup>14</sup> U.S. Department of the Interior. 2010. Landscape Conservation and Public Access in the Chesapeake Bay Region. A Revised Report Fulfilling Section 202(e) of Executive Order 13508.

<sup>15</sup> Southwick Associates. 2005. *The Economics of Recreational and Commercial Striped Bass Fishing, 2005*.

<sup>16</sup> CBF. 2010. *On the Brink: Chesapeake's Native Oysters: What It Will Take to Bring Them Back*.

<sup>17</sup> CBF. 2010. *On the Brink: Chesapeake's Native Oysters: What It Will Take to Bring Them Back*.

<sup>18</sup> CBF. 2010. *On the Brink: Chesapeake's Native Oysters: What It Will Take to Bring Them Back*.

<sup>19</sup> Unpublished data. Dr. James Kirkley, Virginia Institute of Marine Science.

<sup>20</sup> CBF. 2008. *Bad Water and the Decline of Blue Crabs in the Chesapeake Bay*.

<sup>21</sup> Environment Virginia, Research and Policy Center. 2009. Watermen Blues: Economic, Cultural and Community Impacts of Poor Water Quality in the Chesapeake Bay.

<sup>22</sup> *Turning the Tide: Saving the Chesapeake Bay*, Island Press. Tom Horton. 2003.

<sup>23</sup> Mistiaen, J.A., I.E. Strand, and D. Lipton. 2003. Effects of environmental stress on blue crab (*Callinectes sapidus*) harvest in Chesapeake Bay tributaries. *Estuaries* Vol. 26:316-322.

<sup>24</sup> CBF. 2010. *On the Brink: Chesapeake's Native Oysters: What It Will Take to Bring Them Back*.

<sup>25</sup> CBF. 2010. *On the Brink: Chesapeake's Native Oysters: What It Will Take to Bring Them Back*.

<sup>26</sup> Papadakis, M. July 2006. *The Economic Impact of the 2005 Shenandoah Fish Kill: A Preliminary Economic Assessment*. James Madison University.

<sup>27</sup> T.J. Murray and J.E. Kirkley. 2010. *Estimated Economic Impact of Gulf Oil Spill on Virginia's Oyster Industry – July 2010*. Virginia Institute of Marine Science. VIMS Marine Resource Report No. 2010-7.



**(3) *The Bay and Virginia's waters support a regionally vital tourist economy.***

In 2007, visitors to recreational and heritage sites generated \$18 billion in Virginia.<sup>28</sup> Tourist and leisure related industries employed nearly 350,000 workers in Virginia as of June 2010.<sup>29</sup> More than 23 million people visited Virginia's national and state parks during 2009.<sup>30</sup> Statewide, travelers spent over \$17 billion during 2006.<sup>31</sup> Nationwide in 2006, almost three million people fished, hunted, or watched wildlife, and spent over \$2.4 billion pursuing these activities.<sup>32</sup> Virginia, and to a lesser extent Maryland, also support significant freshwater recreational fisheries, with roughly one million anglers participating and contributing millions to local economies.<sup>33</sup> A 2006 study compared the 1996 water quality of the Bay with what it would have been without the Clean Water Act and estimated that the annual recreational boating, fishing, and swimming benefits of water quality improvements ranged from \$357.9 million to \$1.8 billion.<sup>34</sup> A recent study in Hampton, Virginia found that resident and non-resident boaters were responsible for \$55.0 million in economic impact to this city. This impact represents \$32.5 million in new value added, \$22.2 million in incomes, and 698 jobs.<sup>35</sup> The majority of expenditures were by out-of-region boating-visitors which represents an inflow of new capital into the community. The study also indicated that "water quality, fishing quality and other environmental factors" ranked among the most important factors that influence a boater's decision on where to keep his/her boat.

**(4) *Clean waterways increase property value.***

An EPA study indicated that clean water can increase the value of single-family homes up to 4,000 feet from the water's edge by up to 25 percent.<sup>36</sup> A 2000 study concluded that improvements in water quality along Maryland's western shore to levels that meet state bacteria standards could raise property values six percent.<sup>37</sup> High water clarity was shown to increase average housing value by four to five percent or thousands of dollars.<sup>38,39</sup> Homes situated near seven California stream restoration projects had 3 to 13 percent higher property values than similar

---

<sup>28</sup> Virginia Tourism Corporation. *Impact of Travel on Virginia, Preliminary 2007 and 2006*.

<sup>29</sup> U.S. Department of Labor, Bureau of Labor Statistics. [www.bls.gov/eag/eag.VA.htm](http://www.bls.gov/eag/eag.VA.htm). Visited July 22, 2010.

<sup>30</sup> Virginia Tourism Monitor Information. [www.vatc.org/research/Parks/Parks.html](http://www.vatc.org/research/Parks/Parks.html). Visited July 22, 2010.

<sup>31</sup> Virginia Tourism Authority. September 2007. *The Economic Impact of Domestic Travel Expenditures on Virginia Counties 2006*. A Study Prepared for the Virginia Tourism Authority by the Travel Industry Association.

<sup>32</sup> U.S. Fish and Wildlife Service. 2006. *2006 Survey of Fishing, Hunting, and Wildlife Associated Recreation*. FHW/06-NAT.

<sup>33</sup> U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2006. *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*.

<sup>34</sup> Morgan, et al. 2001. Benefits of water quality policies: the Chesapeake Bay, *Ecological Economics*, Volume 39, Issue 2, November 2001, pp. 271-284.

<sup>35</sup> Virginia Institute of Marine Science. 2009. *Assessment of the Economic Impacts of Recreational Boating in the City of Hampton*.

<sup>36</sup> EPA. 1973. *Benefit of Water Pollution Control on Property Values*. EPA-600/5-73-005, October 1973.

<sup>37</sup> C. G. Leggett, et al. 2000. Evidence of the effects of water quality on residential land prices. *J. Environ. Econ. Manage.*, Volume 39, No. 2, pp. 121-144.

<sup>38</sup> Jentes Banicki, J. 2006. Hot Commodity: Cleaner Water Increases Lake Erie Property Values. *Twineline*. Volume 28, No. 3-4. Ohio Sea Grant, Ohio State University.

<sup>39</sup> P. Joan Poor, et al. 2007. Exploring the hedonic value of ambient water quality: A local watershed-based study. *Ecological Economics*, Volume 60, No. 4, pp. 797-806.

homes located on damaged streams.<sup>40</sup> A study by the Brookings Institute projected a ten percent increase in property values for homes that would about a proposed \$26 billion Great Lakes restoration project.<sup>41</sup> Lastly, the City of Philadelphia estimates that installation of green stormwater infrastructure will raise property values two to five percent, generating \$390 million over the next 40 years in increased values for homes near green spaces.<sup>42</sup>

#### *(5) Healthy waters reduce public health costs.*

Clean water decreases public health burdens associated with consuming tainted fish or shellfish or exposure to waterborne infectious disease while recreating. A study estimated the cost associated with exposure to polluted recreational marine waters to be \$37 per gastrointestinal illness, \$38 per ear ailment, and \$27 per eye ailment.<sup>43</sup> Threats from sewage and bacteria forced Maryland and Virginia to close or restrict oyster harvesting in 223,864 acres of the Bay and its tributaries in 2008, about eight percent of the total shellfish beds.<sup>44</sup> A 2009 CBF report recounts swimming advisories and potential health problems associated with blue-green algae (cyanobacteria) blooms in coastal rivers across the region.<sup>45</sup> Although closing a beach is meant to prevent illness, it directly and indirectly results in an economic loss for local businesses and the county where the beach is located. For example, a study by NOAA indicated that a one-day beach closure in Huntington Beach, California was expected to result in thousands of dollars of lost income for local communities.<sup>46</sup>

#### *(6) Pollution reductions lower drinking water and other utility costs.*

Reducing pollution inputs from pipes and land-based sources can reduce locality costs to treat drinking water sources to safe standards. New York City's expenditure of \$1 billion over the last decade to protect the watersheds north of the city that supply its drinking water avoided the need to build a \$6 billion treatment plant.<sup>47</sup> An EPA study of drinking water source protection efforts concluded that for every \$1 spent on source water protection, an average of \$27 is saved in

---

<sup>40</sup> C. Streiner, et al. 1996. *Estimating the Benefits of Urban Stream Restoration Using the Hedonic Price Method--a thesis in partial fulfillment of the requirements for the Degree of Master of Science*. Dept. of Agriculture and Resource Economics. CSU.

<sup>41</sup> J.C. Austin, et. al. 2007. *America's North Coast: A Benefit-Cost Analysis of a Program to Protect and Restore the Great Lakes*. Brookings Institute, Great Lakes Economic Initiative.

<sup>42</sup> Philadelphia Water Department. 2009. *Green City, Clean Waters: The City of Philadelphia's Program for Combined Sewer Overflow Control—A Long Term Control Plan Update*. Summary Report. September 1, 2009.

<sup>43</sup> R. H. Dwight, et al. 2005. Estimating the economic burden from illnesses associated with recreational coastal water pollution - a case study in Orange County, California. *Journal of Environmental Management*. Volume 76, No. 2 pp. 95-103.

<sup>44</sup> Data from Departments of Health in Virginia and Maryland cited by Chesapeake Bay Foundation. 2010. *On the Brink: Chesapeake's Native Oysters. What it will take to bring them back*.

<sup>45</sup> CBF. 2009. *Bad Water 2009: The Impact on Human Health in the Chesapeake Bay Region*.

<sup>46</sup> [http://stateofthecoast.noaa.gov/coastal\\_economy/beacheconomics.html](http://stateofthecoast.noaa.gov/coastal_economy/beacheconomics.html).

<sup>47</sup> DePalma, A. 2006. New York's Water Supply May Need Filtering. *New York Times*. June 20, 2006. [www.nytimes.com/2006/07/20/nyregion/20water.html?\\_r=1&hp&ex=1153454400&en=2be183debc88eac7&ei=5094&partner=homepage&oref=slogin](http://www.nytimes.com/2006/07/20/nyregion/20water.html?_r=1&hp&ex=1153454400&en=2be183debc88eac7&ei=5094&partner=homepage&oref=slogin). Visited July 22, 2010.



water treatment costs.<sup>48</sup> Similarly, a study by the Brookings Institute suggested that a one percent decrease in sediment loading will lead to a 0.05 percent reduction in water treatment costs.<sup>49</sup>

Proactive efforts to lessen stormwater flows today reduce future public costs needed to maintain navigation channels, remediate pollution and hazard flooding, and repair infrastructure and property damage caused by excessive runoff. Philadelphia estimates that after 40 years their installation of green infrastructure will create more than \$2 in benefits for every dollar invested, generating \$500 million in economic benefits, \$1.3 billion in social benefits, and \$400 million in environmental benefits.<sup>50</sup>

***(7) Installation of BMPs and treatment technologies improves water quality, creates jobs, and supports our economy.***

A study by the University of Virginia found that implementation of the agricultural practices to reduce runoff pollution called for in Virginia's tributary strategy, such as livestock stream exclusion, buffers, and cover crops, would generate significant economic impacts. Over a five-year period these actions would create \$940 million in industrial output, a \$455 million impact on gross domestic product, and create nearly 12,000 jobs of one-year duration.<sup>51</sup> This same study concluded that every \$1 spent to implement BMPs generates \$1.56 worth of economic activity.<sup>52</sup> Further, a recent analysis of the value of investing in water and sewer infrastructure concluded that these investments typically yield greater returns than most other types of public infrastructure.<sup>53</sup> For example, one dollar of water and sewer *infrastructure investment* increases private output (Gross Domestic Product) in the long-term by \$6.35. Furthermore, adding one job in water and sewer creates 3.68 jobs to support that job.

***(8) Clean waters sustain aesthetic and cultural value.***

While not easily monetized, clean waterways improve aesthetics and viewsheds that attract businesses and visitors to the region, and nourish heritage economies and cultures that rely upon healthy and productive waters for their way of life.

---

<sup>48</sup> U.S. EPA. *Economics and Source Water Protection*. Presentation by Eric Winiecki, EPA.

<sup>49</sup> [http://stateofthecoast.noaa.gov/coastal\\_economy/beacheconomics.html](http://stateofthecoast.noaa.gov/coastal_economy/beacheconomics.html).

<sup>50</sup> Philadelphia Water Department. 2009. Green City, Clean Waters: The City of Philadelphia's Program for Combined Sewer Overflow Control—A Long Term Control Plan Update. Summary Report. September 1, 2009.

<sup>51</sup> Rephann, T.J. 2010. Economic Impacts of Implementing Agricultural Best Management Practices to Achieve Goals Outlined in Virginia's Tributary Strategy. Weldon Cooper Center for Public Service, University of Virginia. February 23, 2010.

<sup>52</sup> Rephann, T.J. 2010. Economic Impacts of Implementing Agricultural Best Management Practices to Achieve Goals Outlined in Virginia's Tributary Strategy. Weldon Cooper Center for Public Service, University of Virginia. February 23, 2010.

<sup>53</sup> Krop, R.A., C. Hernick, and C. Frantz. 2008. Local Government Investment in Water and Sewer Infrastructure: Adding Value to the National Economy. The U.S. Conference of Mayors, Mayors Water Council.